TELEPHONY

NOV 25 1940
LIBRARY

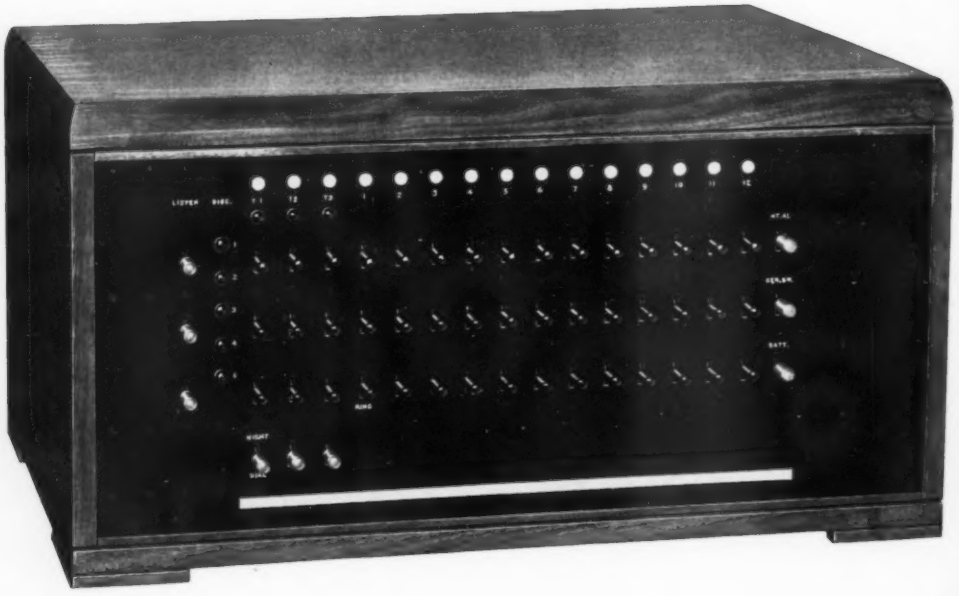
VOLUME 119

NOVEMBER 23, 1940

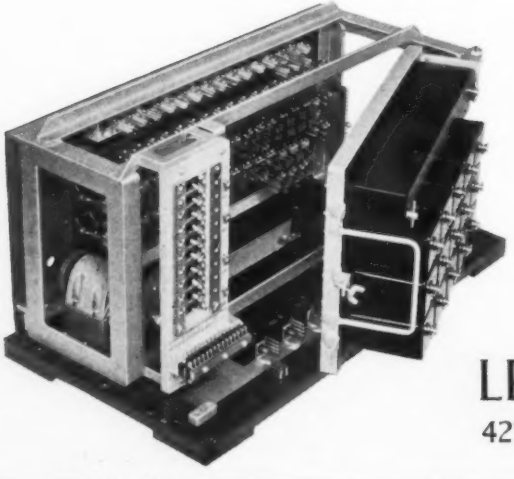
NUMBER 21

XUM

LEICH CORDLESS P-B-X



Modern, simple, sturdy, attractive — the Leich No. 5-B-12 Cordless exemplifies the careful design and fine workmanship inherent in all Leich-Built switchboards. Beneath the streamlined cabinet is a rigid chassis of welded steel — having virtually skyscraper strength. On the reverse side of the polished faceplates are the rugged working parts which have been proved in years of operation and which are constructed to withstand abuse as well as use. Back of the Leich nameplate is thirty-three years of telephone manufacturing experience and an enviable reputation for excellent craftsmanship — a reputation which more telephone companies are coming to appreciate with each year.



Leich Cordless Switchboards are arranged for operation with either manual or automatic central office equipment. They are available in three sizes, ranging in capacity from 12 lines, 3 trunks and 5 links to 20 lines, 5 trunks and 7 links. Figures covering specific units will be furnished without obligation. Write to:

LEICH SALES CORPORATION

427 W. RANDOLPH STREET.. CHICAGO. ILLINOIS

TELEPHONY, November 23, 1940. Volume 119. No. 21. Published every week on Saturday by TELEPHONY PUBLISHING CORPORATION. 608 So. Dearborn St., Chicago, Ill. Telephone Wabash 8604. Subscription $3.00 per year. Entered as second class matter September 4, 1908, at the Post Office at Chicago, Ill., under the act of March 3, 1879.

XUM

The Stromberg-Carlson No. 1212 Self-contained Handset

The Stromberg-Carlson No. 1211 Handset Wall Telephone

In selecting handsets for subscriber use, it is not only important that the instruments should blend into the scheme of home and office furnishings, but also important that they be so designed that they will not be outmoded for many years to come. The graceful design of both the Stromberg-Carlson No. 1212 Handset Telephone and the No. 1211 Handset Wall Telephone proves that these two instruments fulfill both requirements. Their graceful lines mean that they will not only be pleasing to the eye today, but also for many years to come.

But looks alone are not the chief appeal of these two handsets. From a standpoint of both transmission and reception, they are unsurpassed, due to the patented Stromberg-Carlson Transmitter and Receiver which permit a clarity of articulation that was previously impossible.

Order test samples of these two handsets. Test them under your own requirements, and you will see immediately why they are revenue builders.

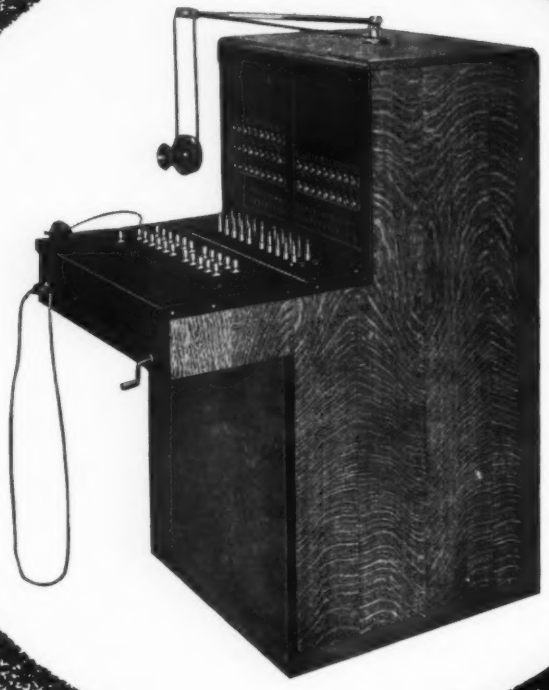
STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY
Factory and General Offices: 100 Carlson Road, Rochester, N. Y., U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

Stromberg-Carlson

MAKERS OF VOICE TRANSMISSION AND VOICE RECEPTION APPARATUS FOR FORTY-FIVE YEARS

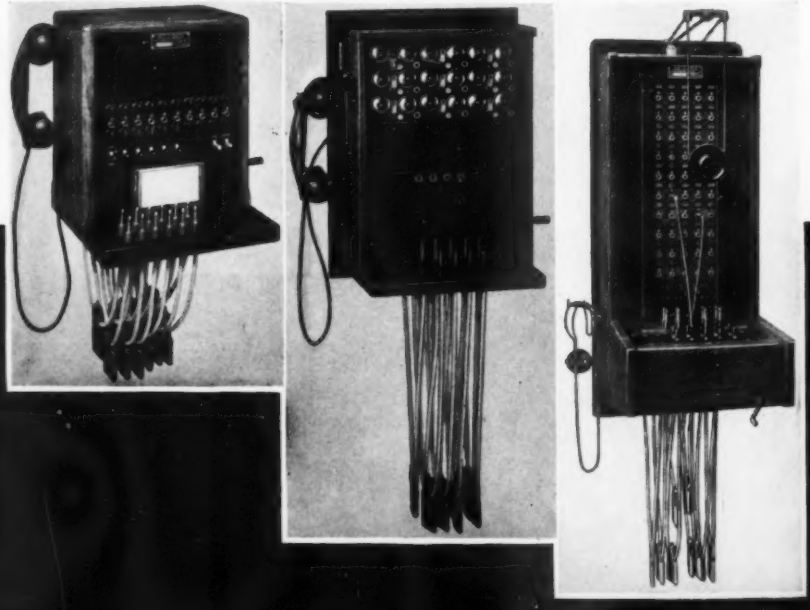
XUM

BEFORE YOU BUY



This attractively designed Masterbuilt Magneto Switchboard is available in various capacities of from 50 to 200 lines. It is built upon a self-contained steel framework which provides a strong, rigid foundation. A side-swinging gate mounts the cord circuit repeating coils and condensers, the operator's telephone circuit, night alarm equipment, etc. This arrangement makes for the greatest convenience and accessibility. Bulletin 123 gives the complete story of these floor type switchboards. Send for your copy.

Complete details of Kellogg Wall Magneto Switchboards contained in Bulletin 124. Write for free copy.



XUM

SEE WHY OTHER MAGNETO EXCHANGE OWNERS

Prefer KELLOGG EQUIPMENT!

One of the important decisions in the life of a telephone exchange owner comes when he purchases new central office equipment. Besides giving satisfactory service to his subscribers, it must pay its own way. For the telephone business is a service business, and to be profitable the equipment must be simple to operate and easy to maintain over a long period of years.

Why are there more Kellogg magneto switchboards in use today than any other make? Simply because these boards have "proved themselves in" on the job through their own merit. Hundreds and hundreds of successful exchanges attest to the reliable, efficient AND PROFITABLE operation of Kellogg equipment.

Whether your new switchboard is to be a large or a small one, you can be sure that it will do your specific job in the most economical way. Because each Kellogg magneto switchboard, like all other types of Kellogg boards, is engineered from the standpoint of accomplishing a definite job in the easiest and soundest possible way. Ruggedness, reliability, simple design and easy operation and maintenance are inherent qualities which go to make these switchboards your best and safest buy. Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago.

★ ★ ★

Many magneto exchange owners, having 200 or more local subscribers, have found that they could increase their earnings and reduce their operating expenses with this highly flexible Masterbuilt Junior Switchboard. We'll be glad to send you some of these Masterbuilt Junior "success stories" without obligation.

KELLOGG SWITCHBOARD & SUPPLY CO.

XUM

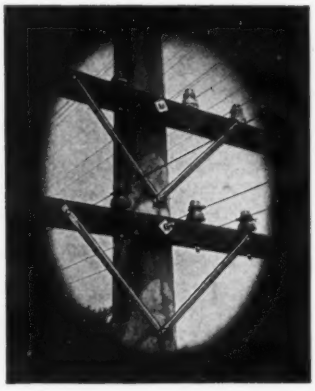
Everstick

ANCHORS

Preferred for pole line construction and maintenance because of their long life, ease of installation and toughness under strains. Made of Certified Malleable Iron with its superior strength and rust resistant qualities. Everstick exclusive nut housing locks anchor firmly on rod. A complete line of expanding anchors: two-, three-and four-way types. Also, rigid type cone anchors. All sizes and holding capacities. Free bulletin.

Joslyn

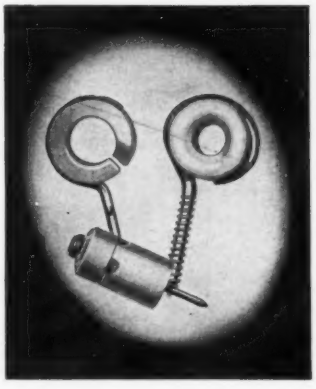
POLE LINE HARDWARE



Joslyn Pole Line Hardware stands up under the worst weather conditions. It is not affected by time—a coating of pure zinc protects it against rust and corrosion. Joslyn products are built to meet a standard—not a price. Complete stocks are carried at warehouses throughout the country to assure you fast, efficient service at any time, anywhere.

Porcelain Products

KNOBS AND SCREW EYES

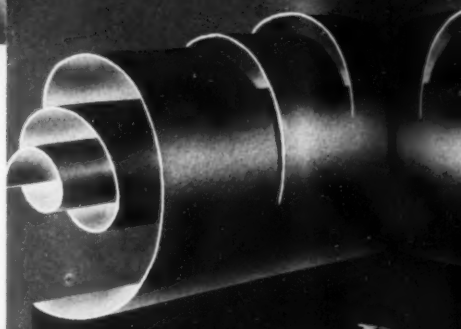


Porcelain Products, Inc., makes Knobs, Tubes, insulated Screw Eyes, etc., of the best hard, vitrified porcelain with dimensions that amply comply with all code requirements. Nail Knobs, too, are made of the same material as the high tension insulators—a far higher grade of material than is ever called for in a knob specification. They save your lineman's time and your company's money. Quick delivery guaranteed.

Armoured Bronze

DROP WIRE

20% longer life! . . . proved by millions and ***millions*** of feet in service. A special armoured coat of Mica, a better method of tracer identification banishing forever the old wear-inducing raised tracer. Long life, moisture-proof insulation. The solid bronze conductor is unequalled: 85% conductivity, 32 ohms resistance, high tensile strength, flexibility and ductility. Order Kellogg Armoured Bronze Drop Wire today!



W
recommnd
BETA
PRODU

Order you
TELEPHOE
supplies fro

KELL

switchboard & supply

XUM

Ideal Storage Battery

FOR FLASHLIGHTS

Day-in-and-day-out flashlight users find that the Ideal Rechargeable Flashlight Storage Battery ***lasts as long as several hundred size D dry cells.*** You can charge it yourself, easily and quickly! It cannot be overcharged! It's positively spill proof! With this Flashlight Storage Battery you ALWAYS have a strong, bright light. And you can do away with the costly, unnecessary expense and nuisance of replacing dry cells. Write today for full particulars!

National Lead's

SOLDER AND LEAD SLEEVES

National Lead Company's Solder and Lead Sleeves have been standards in all cable work for years. The solder is made to Kellogg's rigid specifications, is of the highest obtainable quality, and is recommended for all cable splicing. Lead sleeves are available in many sizes to meet all of your requirements. For a perfect cable joint, specify National Lead Products.

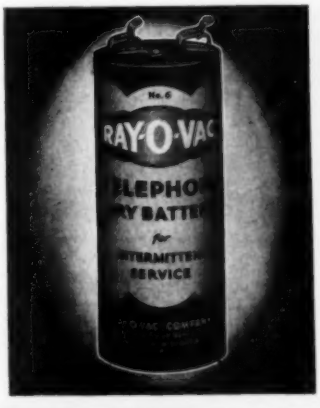
Allen

SOLDERING COMPOUNDS

L. B. Allen Co. Inc., have been specialists in making fine soldering materials since 1893. Their long experience is your assurance of the correct soldering compound for every need. Save time on the job, do neater, cleaner work and be sure of solid, noise-free joints by using the proper compounds for each type of work. Available in many ways to suit your individual requirements—powder, paste, oil, fluid or stick in any strength. Write for free metal chart today.

Ray-O-Vac

TELEPHONE BATTERIES



The Ray-O-Vac Telephone Dry Battery meets today's telephone demands. Season after season, month after month, long after the time you expect ordinary telephone batteries to signal feebly for replacement, Ray-O-Vacs carry on, full-powered and hearty. They cost no more . . . but how they cut down replacement costs! Insure maximum durability by specifying Ray-O-Vac telephone batteries.

nnd these

ETER

DICTS

our

HOE AND LINE

lies from

LLOGG

company, chicago

XUM

EVERY TYPE OF INSULATED CONDUCTOR

USED IN PRESENT DAY

TELEPHONE SYSTEMS

IS MANUFACTURED BY

B.I.

U. K. REG. TRADE MARK

Dry core air space trunk and subscribers cables for underground or overhead use. Switchboard and other cables for exchange use. Telephone cords, enamelled and silk covered wires for the winding of relay coils and receiver bobbins; and wires for the internal connections of every kind of telephone apparatus.

Line wires, insulators and ironwork for open wire lines, and telephone condensers are also among B.I. products.

The B.I. also undertakes complete installations of underground and aerial cables with provision of loading coils if required.

BRITISH INSULATED CABLES LTD.,

CABLE MAKERS AND ELECTRICAL ENGINEERS

HEAD OFFICE: PRESCOT, LANCS., ENGLAND

XUM

GUARANTEED

...*in* black *and* white

An "Eveready" "Air Cell" installation for telephone operators' transmitters consists of two batteries—one No. T-2600 and one No. T-1600—connected in series.

NATIONAL CARBON COMPANY, INC.

specifically

GUARANTEES

that the "Eveready" "Air Cell" Telephone Operators' Transmitter Batteries, Nos. T-2600 and T-1600—when used in the telephone service for which they are designed and in connection with transmitters of modern design, and when properly installed and maintained according to directions provided therewith—will deliver a minimum of 6,000 hours at peak transmission efficiency.

NATIONAL CARBON COMPANY, INC.

GENERAL OFFICES: NEW YORK, N. Y. • *BRANCHES:* CHICAGO • SAN FRANCISCO

UNIT OF UNION CARBIDE AND CARBON CORPORATION

The words "Eveready" and "Air Cell" are registered trade-marks of National Carbon Company, Inc.

XUM

Catalog identification, descriptions and prices for telephones shown above:

Top Row

Q — C.B. Wall Set—Wood—Manual $4.50* ($6.95)
A-1 — C.B. Monophone Wall Set—Manual $9.75* ($11.40)
V — C.B. Wall Set—Wood ..... $4.50* less dial ($6.95 less dial)
T — C.B. Monophone Wall Set ..... $9.75* less dial ($11.40 less dial)

Third Row

H — C.B. Ringer Box—Metal, exposed gongs $2.75* ($3.95)
J — Monophone Desk Stand—Mag. or C.B. ..... ($8.45)
A — Desk Stand—Mag. or C.B. $3.25* ($4.65)
B — Mag. Ringer Box $4.50* ($6.90)
G — Desk Stand—Dial Blank—Mag. or C.B. $3.25* ($4.95)
K — Monophone Desk Stand—Mag. or C.B. ..... ($8.45)
E — C.B. Ringer Box—Metal, enclosed gongs $2.75* ($4.95)

Second Row

Y — C.B. Monophone Wall Set—Dial Blank $9.75* ($11.75)
U — C.B. Wall Set—Metal, exposed gongs—Dial Blank $4.50* ($7.10)
P — Mag. Wall Set $6.50* ($10.60)
W — Mag. Monophone Wall Set ..... $11.75* with AR handset ($15.85 with AR handset)
S — C.B. Wall Set—Metal, enclosed gongs ..... $4.50* less dial ($8.50 less dial)
Z — C.B. Monophone Wall Set—Dial Blank $9.75* ($13.75)

Bottom Row

C — Mag. Wall Set $6.50* ($10.60)
R — Mag. Monophone Wall Set $11.75* ($15.85)

*Plus your telephone—(in brackets—price without trade-in). Automatic models available either with dial blank or dial, as desired. Magneto models shown are priced with 3-bar generators; also available with 4-bar and 5-bar generators at slight additional cost.

XUM

PROFIT FROM AUTELCO REBUILDING SERVICE!

Send in your old telephones to us—get handsome "good-as-new" models like these in return. . . . .

Now you can have your old telephones completely rebuilt and restored to their original condition — by experienced factory craftsmen working under modern factory conditions!

The result? Rebuilt telephones which your subscribers will look on as new instruments — gleaming and bright and practically new inside, too, with defective parts replaced and performance restored to original standards or better.

No wonder Autelco Rebuilding Service is becoming so popular among Independent operating organizations! The economies and savings which can be accomplished are not to be overlooked by any company, small or large.

You can either send in your old telephones to be rebuilt or converted by us, or you can trade them in on other rebuilt models which we have in stock. If you have no old telephones to send us, you can buy rebuilt models in practically every style and for every purpose, direct from stock at surprisingly low prices. Send for Circular 1640-B, which shows pictures and prices of telephones in stock and outlines our proposition in full. Write for it—today!

Autelco Rebuilding Service is available also for rebuilding central office switchboards, P.B.X's, P-A-B-X's, test panels, power panels, etc. When desired, we can supply replacement equipment to provide service while your equipment is in our plant.

AUTOMATIC ELECTRIC

MAKERS OF TELEPHONE SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES CO., 1033 W. Van Buren St., Chicago, U. S. A.
Export Distributors: AUTOMATIC ELECTRIC SALES CO., LIMITED

XUM

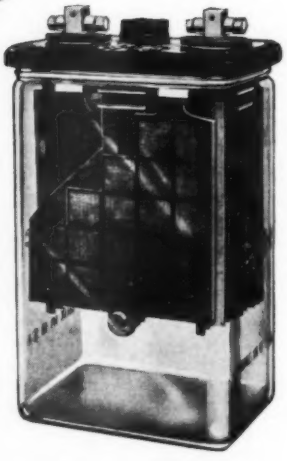
EVEN EXPLODING CONDUITS COULD NOT CAUSE A PROLONGED INTERRUPTION

THOUGH manhole covers hurtled in the air, this was no commonplace explosion. Under half a mile of Main Street, conduits became filled with gas . . . and when the explosion came, long lengths of burning cable caused a widespread interruption of P.B.X. service. But quick action, with the help of emergency batteries, promptly restored service throughout the business section while permanent repairs were being made.

This is another instance of the tradition that underlies telephone dependability. It is shared alike by telephone men and women and by the equipment on which they rely . . . among which Exide Batteries hold an important place.

Since 1895, Exides have been helping to maintain the highest standards of quick, clear service. They help unfailingly to complete millions of calls each day. And in emergencies, they stand ready to pour out their tremendous reserve power without stint. Neither fluctuations nor interruption of the a.c. power affects their steady flow of energy.

No matter what the service—common battery, emergency reserve, signal, or P.B.X., in small or large exchanges—you will find in Exide Batteries the same sure dependability for which American telephone service is envied throughout the world.



Exide

TELEPHONE BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

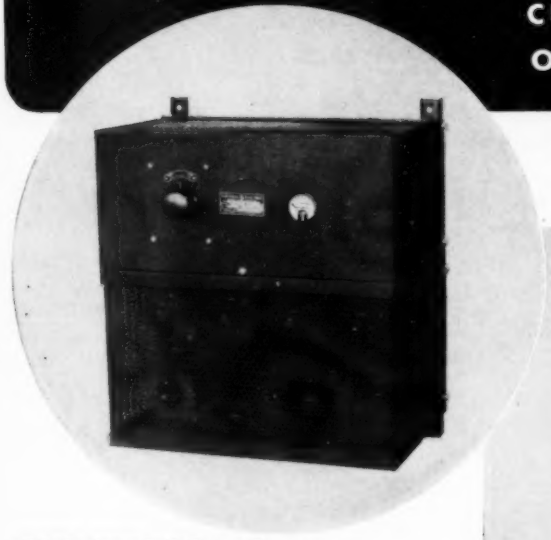
The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

XUM

WHEN YOU INSTALL BATTERY EQUIPMENT

CHOOSE A G-E COPPER OXIDE OR TUNGAR BATTERY CHARGER

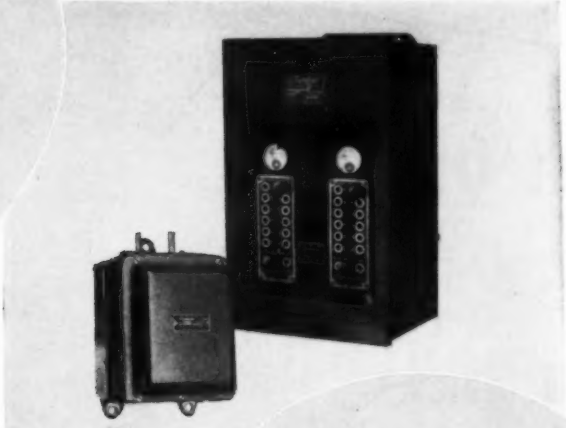


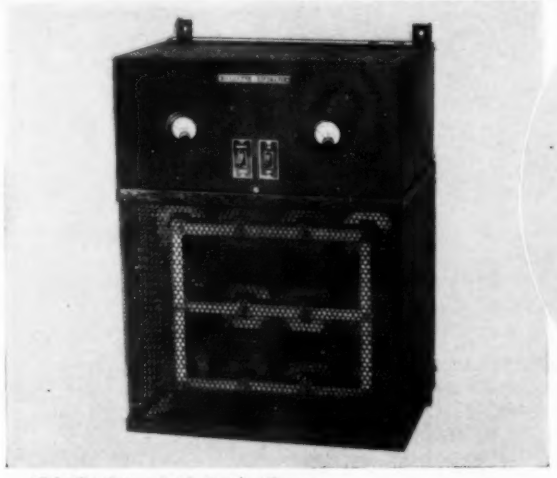
6RC99D1 Copper Oxide Battery Charger

No moving parts to wear out. High efficiency—all the adjustment is made with a transformer. Internal filter for quiet operation. Provides trickle charge for large batteries or full charge for small batteries.

This 12-amp. full-wave Tungar is excellent for float-charging telephone batteries. Wide charging range: 6-65 volts, 2-12 amperes. Highly efficient operation.

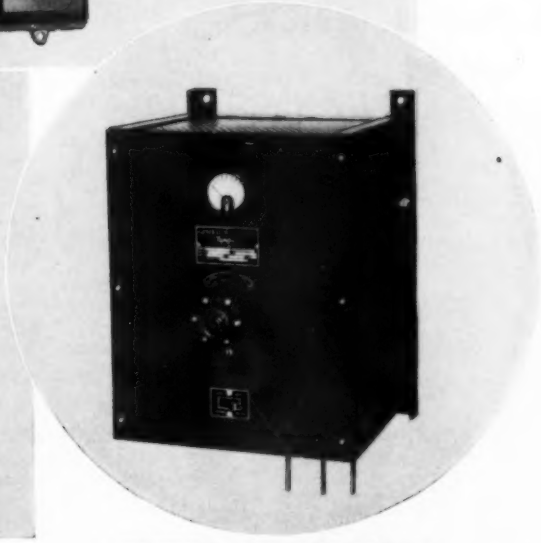
6RB6B17 Tungar Battery Charger with External Filter Reactance





6RC96D4 Copper Oxide Battery Charger

Responds automatically to battery voltage. Inverse temperature compensated automatic control. Protects battery against over- or under-charging. Eight different models available.



6RB10C5 Mercury Tungar Battery Charger

Full-rated output of 6 amperes from 19 to 52 battery volts. Filter reactance. Excellent charger for medium-sized exchanges. Fine for continuous 3-amp. float charge.

For further information, just write to Section A-081, Appliance and Merchandise Dept., General Electric, Bridgeport, Conn.

GENERAL ELECTRIC

XUM

BOTH are golfers

...but ONE is a CHAMPION!

Developed and constantly improved *in the world's largest battery laboratory, "Eveready" "Columbia" "Gray Label" Long Life telephone cells combine long life, rock-bottom economy and sustained voltage.*

It's control that makes the difference!

A champion golfer keeps control under constant strain. A champion battery keeps control under constant *drain.*

Many telephone men have discovered by years of trial and comparison that "Eveready" "Columbia" "Gray Label" Long Life telephone cells have the controlled stamina that means top performance under grueling conditions.

Competition against all comers has proved that these champion cells give higher sustained voltage that helps maintain better transmission standards... insure subscriber satisfaction.

That's why more "Eveready" "Columbia" "Gray Label" Long Life telephone cells are used by independent telephone companies *than any other brand.* May we suggest that you specify them in your next order?

CHAMPION FOR THREE REASONS

1. LONGER LIFE. More economical . . . give you many extra hours of service life.

2. SUSTAINED VOLTAGE. Means improved transmission efficiency.

3. UNIFORM QUALITY. Every cell identical... built to a single standard of highest quality.

NATIONAL CARBON COMPANY, INC.
General Offices: New York, N. Y.
Branches: Chicago and San Francisco
Unit of Union Carbide and Carbon Corporation
UCC

The words "Eveready", "Columbia", and "Gray Label" are trade-marks of National Carbon Company, Inc.

XUM

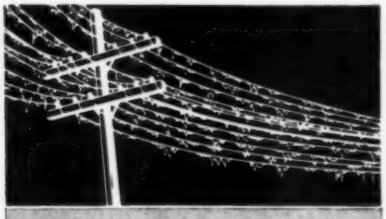
WHY IT WILL PAY YOU TO USE Amertel

THE illustrations shown here with explanatory captions quickly demonstrate the outstanding improvements that are embodied in *Amertel-85* and *Amertel-135* Telephone Wires. It will pay you to remember the name *Amertel* and to use it whenever you place an order for telephone wire. We will be glad to supply you with complete technical data on *Amertel-85* and *Amertel-135*.

Amertel is also available in the regular grades "EBB" . . . "BB" and "Steel."

Amertel lowers maintenance costs

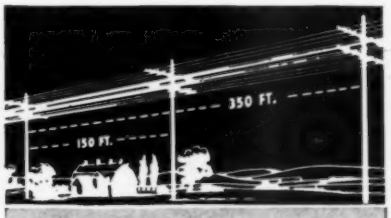
Amertel lowers construction costs



Amertel has greater safety factor—withstands heavier ice and wind loads

Amertel offers added strength
(Minimum breaking strength—No. 12 B.W.G.)

Amertel-135 grade	1213 lbs.
Amertel-85 grade	793 lbs.
Amertel B.B. grade	476 lbs.



Amertel makes longer spans possible

Amertel-135 grade	350 ft.
Amertel-85 grade	225 ft.
Amertel B.B. grade	150 ft.

Amertel has increased transmission efficiency at voice-frequency.

AMERICAN STEEL & WIRE COMPANY

Cleveland, Chicago and New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

UNITED STATES STEEL

LEADING telephone exchanges throughout the world are cutting their battery maintenance costs with Philco Batteries. At the same time they are getting longer battery life, dependable, trouble-free service and superior performance. Investigate these efficient Philco Batteries now . . . let our engineers help solve your problems . . . write us.

No Low Cells!

Only PHILCO gives you Floté in Steel-Glass BATTERIES

PHILCO, BATTERY DIVISION, PHILADELPHIA, PA.

They're Satisfied --and THANKFUL . . .

As You Will Be When You Use the *Nicopress* Method of Splicing and Dead-Ending

Strong and tight are the splices and dead-ends made by the Nicopress Method. And the compact, conveniently handled Nicopress tool assures easy operation in making the splices.

You'll like "Nicopress" and be completely satisfied with the trouble-free splices and dead-ends made by this modern, economical splicing method.

Nicopress Sleeve and Completed Splice

Offset Dead-End Sleeve and Completed Dead-End

THE NATIONAL TELEPHONE SUPPLY CO.
5100 SUPERIOR AVE. — CLEVELAND, OHIO
Canadian Mfr.—N. Slater Co., Lt'd., Hamilton, Ont.
Export Distributor—International Standard Electric Corp., New York, N. Y.

MAKE IT A *Nicopress* SPLICE

TELEPHONY

brings you every week the important developments in the telephone field. The editorial staff carefully selects material and publishes it accurately. This policy saves you time—enables you in a few minutes' reading to keep posted on everything worthwhile happening in the telephone field.

Everyone should have his own TELEPHONY copy. It's an investment that will pay dividends in future advancement and personal development.

TELEPHONY is not "just another trade paper." It's a *weekly information service* full of ideas you can adapt to your exchanges. Its advertisements represent reliable firms producing the best of equipment.

CIRCULATION THIS WEEK
10,800 COPIES!

Telephony

The Journal of the Telephone Industry

Vol. 119 NOVEMBER 23, 1940 No. 21

Published by
TELEPHONY PUBLISHING CORP.
608 So. Dearborn Street, CHICAGO
Telephone Wabash 8604

H. D. FARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary
H. D. FARGO, JR., Vice-President and Advertising Manager
A. J. STULTS, Western Manager

Subscription — 10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

IN THIS ISSUE

STATION INSTALLATIONS ON RURAL LINES—*By Ray Blain* 18
IN THE NATION'S CAPITAL—*By Francis X. Welch* 21
PRINCIPLES OF SALESMANSHIP (Ninth article)—*By Horace Kramer* 23
SMALL EXCHANGES CAN BE MADE DIVIDEND-PAYING 25
By H. R. Burr
SWITCHBOARD REPLACEMENT AND CONVERSION PROBLEMS 26
By Emmett D Talbot
ELEMENTS OF TELEPHONE SERVICE (First instalment) 29
By Harry Chapman
STREAMLINING RURAL SERVICE 31
THE OPERATORS' CORNER—*By Mayme Workman* 33
NEW IDEAS FOR PLANT AND EXCHANGE—*By Ray Blain* 36
DEFENSE EFFORTS ENDORSED BY SOUTH CAROLINA COMPANIES 38
J. A. SMITH PASSES AWAY 42
VACUUM TUBE TESTER LOCATES LINE FAULTS 45
ROBBING PETER TO PAY PAUL—*By Anne Barnes* 51
COMMISSION AND COURT ACTIVITIES 55
HERE AND THERE IN THE FIELD 59
"*TELEPHONY'S*" ENGINEERING DATA—*By B. C. Burden* 60

Front Cover 20
Coming Conventions 33
News Briefs 54

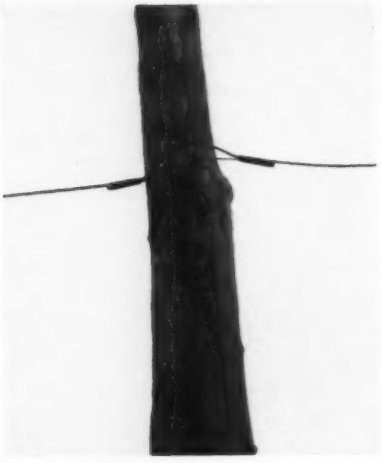
ADVERTISERS' INDEX

	Page
Acme Visible Records, Inc.	—
Acorn Insulated Wire Co.	—
Ad-Lee Co., Inc.	—
Allen Co., Inc., L. B.	7
American Appraisal Co., The	61
American Automatic Electric Sales Co.	10-11-34-35-41
American Creosoting Co.	46
American Fork & Hoe Co., The	—
American Steel & Wire Co.	15
American Telephone & Telegraph Co.	—
Anaconda Wire & Cable Co.	6
Armstrong Cork Co., Whitall Tatum Glass Insulators Dept.	—
Automatic Electric Co.	10-11-34-35-41
Automatic Telephone & Electric Co., Ltd.	—
Babcock Garrison	61
Bartlett Mfg. Co.	—
Berry & Co., L. M.	61
Brach Mfg. Co., L. S.	58
British Insulated Cables, Ltd.	8
Buckeye Telephone & Supply Co.	62
Burgess Battery Co.	—
Calculagraph Company	—
Carney & Co., B. J.	61
Carpenter Mfg. Co.	62
Chance Company	42
Christiansen Co., C. M.	61
Churchill Cabinet Co.	—
Clark, Frank M.	62
Coffey System & Audit Co.	—
Coffing Hoist Co.	—
Columbia Steel Co.	15
Cook Electric Co.	—
Cook's Sons, Inc., Adam	—
Cope, Inc., T. J.	—
Copperweld Steel Co.	—
Cuneo Press, Inc., The	56
Davey Tree Expert Co.	38
Dillon & Co., Inc., W. C.	—
Donnelley & Sons, R. R.	—
Electric Storage Battery Co.	12
Everstick Anchor Co.	6
Fansteel Metallurgical Corp.	—
Fibre Conduit Co.	—
Forged Steel Products Co.	—
Fort Wayne Printing Co.	—
Fowle, Frank F.	61
General Cable Corp.	39
General Electric Co.	13
Goshen Mfg. Co., The	—
Gould Storage Battery Co.	—
Graybar Electric Co.	Third Cover
Gray Manufacturing Co., The	44
Harter Corporation, The	—
Herdrich & Boggs	61
Highway Trailer Co.	—
Holtzer-Cabot Electric Co.	—
Hubbard and Co.	53
Ideal Commutator Dresser Co.	7
Indiana Steel & Wire Co.	49
International Creosoting & Construction Co.	61
International Harvester Co.	—
Joslyn Mfg. & Supply Co.	6
Kearney Corp., James R.	45
Kellogg Switchboard & Supply Co.	4-5-6-7
Kester Solder Corp.	—
Klein & Sons, Mathias	—
Leich Sales Corporation	Second Cover
Lenz Electric Mfg. Co.	—
Line Material Co.	—
Loomis Advertising Co.	—
Lorain Products Corporation	59
MacGillis & Gibbs Co.	61
Matthews Corp., W. N.	—
Michigan Pole & Tie Co.	55
National Carbon Co., Inc.	9-14
National Construction & Engineering Co.	—
National Fireproofing Corp.	—
National Lead Co.	7
National Telephone Supply Co.	16
North Electric Mfg. Co., The	Back Cover
Owens-Illinois Glass Co., Hemingray Division	48
Paragon Electric Co.	40
Partridge Lumber Co.	61
Peatrophone Corporation	54
Philco (Battery Division)	16
Phillips Electric Works, Inc.	—
Porcelain Products, Inc.	6
Porter, Inc., H. K.	—
Premax Sales Division, Chisholm Ryder Co., Inc.	—
Raytheon Mfg. Co.	50-51
Ray-O-Vac Company	7-52
Rebuilt Electric Equipment Co.	62
Reliable Electric Co.	43
Remington Rand, Inc.	—
Roebling's Sons Co., John A.	—
Schauer Machine Co.	—
Seyler Mfg. Co.	56
Seymour Smith & Sons, Inc.	—
Shallcross Mfg. Co.	—
Sloan & Cook	61
Sparta Manufacturing Co.	61
Stephens Co., E. W.	54
Stewart Brothers	—
Stromberg-Carlson Telephone Mfg. Co.	3
Sturgis Posture Chair Co.	61
Suttle Equipment Co.	—
Telephone Repair Co.	60
Tele-Tile Co., The	58
Telkor, Inc.	38
Union Carbide & Carbon Corp.	9-14
United States Steel Corp.	15
Utica Drop Forge & Tool Corp.	—
Utilities Service Co.	57
Valentine Clark Corporation	61
Vanderveer & Walker	47
Wagner-Malleable Products Co.	—
Western Electric Co.	—
Weston Electrical Instrument Corp.	—
Westwood Press, The	62
White, Weld & Company	—
Whitney Blake Co.	—
Wood Preserving Corp., The, a Koppers subsidiary	—
Wopat, J. W.	61
Wray & Co., J. G.	61

XUM

STATION INSTALLATIONS

A PROCEDURE is outlined for running the drop wire and attaching it to a building, for inside wiring of telephone, and for connecting the protector and telephone instrument



Method of using "P" type drop wire clamps on last span of line before making house attachment.

Sleeve connection used to make connection of ground wire to rod.

The outside type protector mounted on a brick wall.

THE RURAL telephone station installation, as considered in this article, covers the spur, or drop, from the main line to the house, and the installation of the telephone, protector and house wiring. When the spur line is not over 100 or 200 feet in length, it is usually run with parallel or twisted-pair drop wire; but when of one-quarter mile or longer, all except the last span is generally run with open wire. When open wire is attached direct to the house, a humming sound caused by the vibration of the wires in the wind may prove annoying; for this reason the last span, at least, should be run with drop wire.

The line wires should dead-ended properly at the point where they are to be connected to the drop wire. When the dead-end is made on a crossarm it should be well braced so as to remain in alignment under the added strain of the dead-end. When the dead-end is made on brackets the latter should be properly reinforced by wire ties or by the special cleat fixtures now available. Strain insulators provide an ideal means of dead-ending open wires at the point the drop wire is to be connected for extension to the house.

Drop wire clamps and drive hooks are now generally considered more desirable than knobs and tie wire for attaching the drop wire to the pole and building. Solderless connectors are recommended and considered better than soldered joints for connecting the drop wire to the line wire. When drop wire is soldered to steel wire, the galvanizing is generally damaged so that corrosion occurs later.

The span length for drop wire should ordinarily be limited to 150 feet, or less when possible. A span of this length should have at least four feet of slack left in it; a span of 100 feet, two feet; and 50 feet, six inches of slack. On rural line drops, short spans are generally possible and are always desirable. Drop wires should always be run so as to provide maximum clearance from trees and other objects.

The sag in drop wire will gradually increase in service. For this reason it is always best to run drops under rather than over obstructions except when a clearance of several feet can be obtained. While a span length of 200 feet may be used where proper clearance can be obtained, it is not desirable in sections where sleet loading is medium or heavy.

Trees should be cleared by drop wire at all costs for they are deadly to the outer braid covering and will soon ruin the insulation. Frequently trees may be avoided by the use of an additional pole or by making contact on the house at some other point. Trees should be trimmed, when necessary, to remove all limbs near drop wire. When clearance cannot be obtained, the drop wire should be protected where it comes in contact with branches. This protection can be provided by sliding circular loom over the wire and taping the ends in place.

Tree attachments with drop wires should be avoided when possible, due to the swaying in the wind placing extra strain on the wire. However, such tree attachments are sometimes permissible on p r i v a t e property where the use of additional poles might prove unsightly.

When trees are used, attachments should be made on large parts of the tree and never on limbs less than three inches in diameter. When drop wires are attached to trees, at least one foot more of sag should

On Rural Lines

By RAY BLAIN

be left in them than when pole supports are used. Screw eyes and drop wire clamps should be used in making the attachments.

Two different types of drop wire clamps are now in common use for the dead-ending of drop wire. One type is a small spiral arrangement around which the wire is wrapped with a spiral snubbing effect. The other type, known as the P clamp, consists of a sleeve and wedge arrangement with a copper wire loop attached.

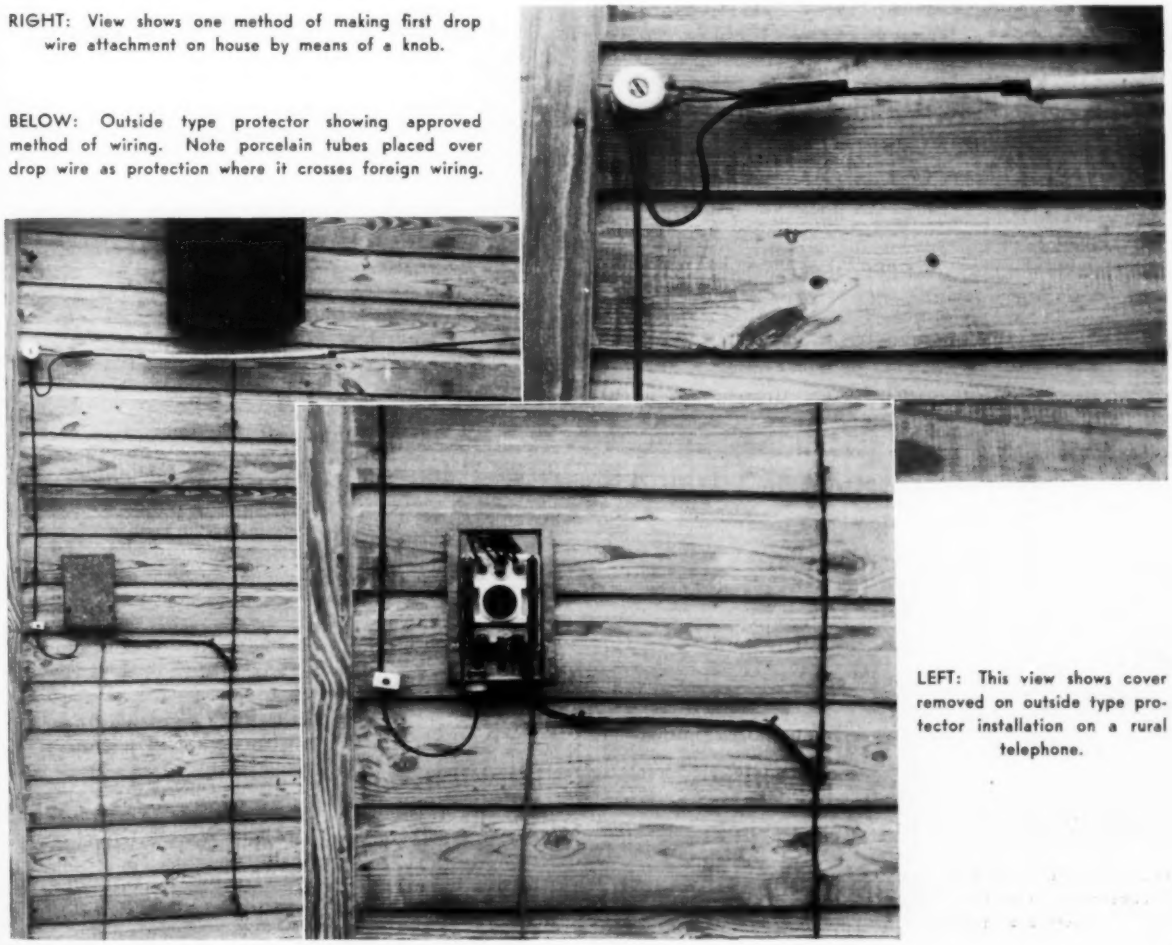
This clamp is installed by placing the drop wire in the sleeve and pulling the wedge inside it to grip the wire firmly. The drop wire clip is designed for use as an intermediate support and to eliminate the need of a knob and tie. These clips are placed on the wire and clamped in place with a pair of ordinary pliers. Both types of clamps are best supported and attached to poles by the use of drive hooks. A small screw type hook is recommended for use in making attachments to buildings.

Drop wire need not ordinarily be spliced for the short runs generally used on rural lines. When splicing of drop wire is considered necessary, the use of the compression type sleeves and good friction tape is recommended.

In some few locations an underground service entrance from the pole where the open-wire dead-ends to the house may prove desirable. Buried type wire or one-pair steel-tape-armored cable may be used in lieu of aerial drop wire. When the underground service is used, a protector should be installed on the pole and between the open wire and the underground cable. Underground connections are more expensive than aerial construction and are not or-

RIGHT: View shows one method of making first drop wire attachment on house by means of a knob.

BELOW: Outside type protector showing approved method of wiring. Note porcelain tubes placed over drop wire as protection where it crosses foreign wiring.



LEFT: This view shows cover removed on outside type protector installation on a rural telephone.

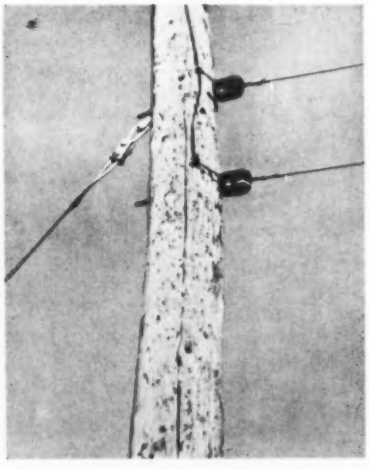
dinarily used except to meet a special condition.

The first drop wire attachment at the house should be made with a view of having a short and most direct run of wire to the protector. Drop entrances into attics are to be avoided when possible, although basement entrances are desirable when dry and accessible. Porcelain tubes or circular loom should be used to protect the drop wire where it extends through the outside wall into the house.

The hole for the entrance should be bored sloping upward from the outside and a wrap of tape placed around the wire pulled into the tube from the outside to prevent the entrance of moisture.

Wire may be supported at regular intervals on the building run by porcelain-insulated screw eyes or knobs. These supports should be spaced so as to hold the wire firm and prevent it swinging in a high wind. The last attachment should be made by the use of a "C" knob, which is essentially a small porcelain cleat that clamps the wire and is held in place with a screw. This last attachment should be placed comparatively near the drop wire entrance hole.

The outside mounting weatherproof protector is now generally preferred for all rural line use. This protector has numerous advantages, the principal one being that it may be located on the outside of buildings and is readily available at all times for inspection by troublemen. This feature permits many lines to be cleared when a subscriber may be away from home and the house locked.



Special insulators of the power variety used for deadending a rural line. Note eye-bolt method of guying.

This type of protector also permits the drop and ground wires to be connected to the protector outside of the building and then only one pair of wires need extend through the wall to the telephone. Some claim that a terminal mounted outside a building is subject to tampering by unauthorized persons. This has now been overcome by equipping the cover with a seal of the type used to protect electric meters and fuse cutout boxes.

When the inside type of protector is used it should be mounted as near the drop entrance as possible. These protectors should never be mounted in closets or confined places. Protectors should always be mounted vertical and not horizontal. A dry basement is an ideal location for the installation of protectors and this location also simplifies the station wiring. A protector should never be installed in a damp location or near a window curtain or other inflammable material.

When the inside mounting protector is used, a ground connection should be made on a cold water pipe when available, by the use of a suitable ground clamp. The ground wire for any type of protector should be run as direct as possible with no sharp turns. It should be of No. 14 gauge copper wire, braided and rubber-covered.

The ground wire should be run in the open and never inside conduit or metal molding. A wood molding may be used for mechanical protection when necessary. Ground wires should never be run across or very near electric power wires. Ground wires extended through walls should always be placed in a separate hole from the line or instrument wires.

The ground connection is most important. It should always be made with extreme care, for even the best protector cannot function properly unless equipped with a good low-resistance ground connection. Good ground rods are now available at a low cost and, when properly installed, provide a most satisfactory ground connection.

It has been proved that a much better connection can be made by making use of a longer rod. For this reason a ground rod with a length of five to six feet at least should always be used on rural telephone installations. In some soils a longer rod may be required. In such event a sectional rod or one of the five-foot type, driven in the bottom of a hole dug for the purpose, may be used. When a rod ground proves defective, it is generally due to a poor connection being made between the ground rod and the wire.

Some rods come equipped with a short length of No. 12 copper wire soldered in place, which may be spliced to the ground wire after the rod has been driven. This connection may be well made with the use of a compression type sleeve. Other rods are equipped with a special clamp which may be used in making a good connection to the ground wire without soldering. Soldering the ground wire direct to the rod on the job does not ordinarily prove satisfactory.

The telephone location should be always selected with extreme care. The instrument should be located on a dry, solid wall and never near a window which could be left open during a storm. Neither should the telephone be placed near radiators

(Please turn to page 43)

FRONT COVER

When one thinks of the millions of farms in the United States, similar to the one shown on the front cover, there comes the realization that the telephone is truly a friend to the farmer from every point of view. It is practically a necessity in running his farm successfully, because farming is a busy business and the seasonal activities keep him pressed for time.

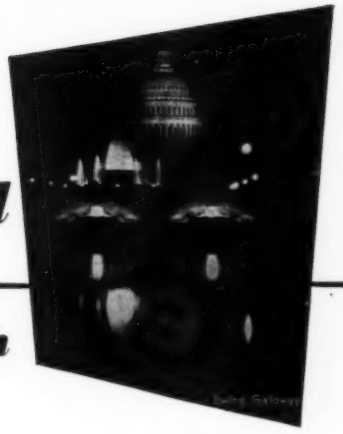
A telephone on the farm is invaluable in emergencies. It often avoids useless trips to town; it saves time in ordering parts when farm machinery breaks down; it helps to secure higher prices or sell surplus farm products; it brings extra help during busy seasons; it affords protection, particularly when dreaded fire breaks out; it permits instant contact with the county farm agent, or it brings the veterinarian when livestock becomes sick.

In many instances it is the housewife who realizes the need for a telephone on the farm and who feels that it no longer pays to try to get along without one. During bad weather it permits her to establish social contacts; in illness it brings the doctor.

There are countless things to be done in running a farm, and many modern farms have extension telephones in outlying buildings. Unquestionably, a telephone in a farm home contributes to a fuller and happier life. One of the keys to profitable farming is how to save time, and that can best be done by having a telephone conveniently at hand.

XUM

In the Nation's Capital



by Francis X. Welch

Special Washington, D. C., Correspondent for TELEPHONY

A LOOK at America's procedure for building up defenses against an invader discloses conflicting opinions. . . . Long-range trend towards some form of national socialism is in the air. . . . FCC's intervention in Pacific Coast rate case supported by various state commissions

ALL FACTIONS in Washington agree that America must not waste one day, nor one hour nor one minute in the completion of the task of making herself invincible. But united opinion ends right there—with the general objective. Opinions as to the best means to that end have produced considerable confusion and conflict.

This confusion is bound to spill over into the field of business economics. It is bound to affect the judgment of business executives upon whose shoulders much of the responsibility for progress in the national defense program rests.

It would be false oversimplification to blame this confusion upon any post-election cleavage between the New Dealers and Willkieites. True, much of the conflicting sentiment as to defense policy is likely to channel through the opposing partisan grooves. But that is simply because those are the lines of least resistance. Within both parties can be found dissenting elements.

Within the Republican party there is the isolation group flushed with its minority political triumph in the Middle West, as distinguished from interventionist Republicans like William Allen White of Kansas and Congressman Kenneth Simpson of New York. Between the two stand the aid - to - Britain - within - reason members, exemplified by Mr. Willkie himself.

Over on the other side of the aisle, as they say in Congress, we find apparently conflicting temperaments within the administration's own diplomatic corps. There is the all-out-for-England attitude of our former ambassador to France, Bill Bullitt. There's the let's-look-out-for-ourselves attitude displayed by our ambassador to England (at this writing), Joseph P. Kennedy. Then, of course, there are the Democratic isolationists led by Senators Clark of Missouri, Wheeler of Montana, and (more mildly) Walsh of Massachusetts.

Aside from the question of how much we should help England, there is the inevitable question of paying the bill for whatever we do along the lines of national defense. Should we at least make some attempt at pay-as-we-go taxation? Or should we boost the national debt indiscriminately, leaving the bill, as one cynical Congressman said, to be paid by future generations "who are not among my constituents?"

It would be a rash observer who tried to predict which of these lines is going to be followed. Even the administration has not shown its hand in all details. Much, too, depends on the progress of the war abroad during the next few critical months. Yet it is possible for us to chart certain broad outlines within which Washington policy patterns will emerge.

First and foremost question in the minds of all business men is whether we will actually get into war—within the next three months, six months, next year? The answers, respectively, seem to be, (1) "no war for three months," (2) "can't tell" as to six months, and (3) "probably not" within a year assuming that we pass the six-months' period in peace.

THE IMMEDIATE reaction to the third-term victory on the part of many business men was the assumption that it increased our chances of actual participation in the European conflict—that a Republican victory would have at least slowed up the momentum towards intervention. This was probably a valid reaction as far as the psychology of the present administration is concerned.

But there are deterring factors which have been quiescent during the campaign (for obvious reasons) and which are now coming to the fore. The "America First" movement headed by General Wood and abetted by prominent publishers is going to make a powerful bid for American sympathy. This leans toward the Lindbergh line of hemispheric isolation.

Out of the propaganda may come a middle-of-the-road attitude, such as that attributed to Ambassador Kennedy in his much-discussed press interview. The gist of this is: Help England all we can as long as we clearly understand it as a means of gaining time for perfecting our own defenses. But under no circumstances should we allow ourselves to be drawn into actual war.

That's not a prediction. It is simply the best bet in a three-horse race for public favor which is going to become a hot contest during the next three months.

Should England unexpectedly collapse, there are those in the administration who would demand that we throw aside all restraint and pitch in and salvage what could be saved of the British Empire. By the same token, there would then be equally

XUM

strong forces at work here to have us fall back on isolation lines and continue our defense program at full speed. Between these two short-range alternatives, the edge seems to be slightly in favor of the administration interventionists. However, most expert observers seem to think Britain should now be able to hold out at least until the spring. That is the way they talk in Washington.

NOW AS TO BUSINESS. All agree the short-range business outlook is excellent. Manufacturing industrial production is already rolling at ever-increasing speed. Soon the increased employment and payrolls will react upon the retail and service areas of business and soon even the farm areas will feel the general upsurge. Incidentally, some form of export crop subsidy (result of the recent farm revolt to the GOP) is likely to be cooked up at the next Congress as an added soothing syrup for the rural elements.

For the telephone industry, manufacturing and operating, all this is to the good as far as it goes. But it must be remembered that it is a short-range outlook — an artificial stimulant. It will last at least two years, probably not longer than four, assuming our ability to avoid actual war. If war comes, much of the stimulating effect will be offset by stringent bureaucratic regulation which, some observers are afraid, will just about hog-tie business for good in this country.

The long-range view on business is too obscure for any discussion at all. Few expect an out-and-out victory for Britain in the sense of the Allied victory of 1918. But many feel that Britain may be able to wangle a stop-gap and face-saving peace if she can hold out a year. In such an event, slowly reviving American export trade may pull us through the economic headache bound to result from the rearmament stimulus.

In case of a German victory, without us in the war, the reconstruction period will be much slower and more painful. In case of outright war, the future of American business, of course, would depend pretty much on the outcome of the war.

What about fiscal policy? Higher taxes next year will be a certainty. Principal targets will be a broadened base and higher rate for personal income, and the removal of tax exemptions from municipal and other public securities. Business taxes, in general, will be higher.

However, the full effect of the rearmament program will NOT be felt next year or even the year after. The administration is opposed to any pay-as-we-go idea because it feels it is necessary to get industry actually geared to the new defense tempo. It wants to see the wheels of production actually rolling before throwing any wet blankets around in the form of skyscraping tax increases. Politicians being what they are, this attitude is likely to prevail through 1941.

Will this mean high national debt, inflation? Yes and no. Best bet is that Congress will increase the debt limit at next session to about 60 billions, but not to the 75 billions recently suggested by Senator George of Georgia. Strong Republican opposition should help to keep this down. For the present, the monetary controls exercised by the administration should be able to check any threat of drastic inflation. Little by little there will be inflation until the whole national and international monetary picture clears up sufficiently for the world to find out who is holding the blue chips and who is all-finished economically.

Finally, will the anti-utility virus break loose again? Probably not in the form of public ownership. There are some extreme New Dealers, of course, who will persist in interpreting the recent election as a "mandate" to go after the utilities along direct lines of socialization. But the practical difficulty in this course is the lack of money. Public ownership takes money—a lot of it. Congress, of course, and the majority of the administration are more intent right now in spending every available penny on national defense.

Some public ownership ventures, such as the St. Lawrence seaway-power project, will be slipped

(Please turn to page 50)

LAUGHING TOWERS
"BEG PARDON, IS THE LADY OF THE HOUSE IN?"
BY SIMS and LEE
BULLER BRUSH CO.
REPAIR KIT
THE LADY IN ROOM 999 ASKS THAT WE DON'T CHARGE HER FOR THAT LONG-DISTANCE CALL-SHE DIDN'T ENJOY TALKING TO HER SISTER-IN-LAW!
HELP! OPERATOR - HELP! THERE'S A BLITZKREIG GOING ON HERE!
REPAIR KIT
PAY NO ATTENTION TO IT, MISTER-MY HUSBAND'S ALWAYS PLAYING PRACTICAL JOKES!
THERE GOES JERRY, TALKING IN HIS SLEEP AGAIN!

Principles of Salesmanship

Salesmanship is not the imposing of one will upon another to make the prospect buy something he does not want.

"BUYMANSHIP" might be a better word to express the principles of selling. The prospect must be convinced that his buying will be to his advantage. (This is the ninth article in a series on selling)

THROUGHOUT this series on selling the telephone we have been dealing with the *qualities* necessary for success, not only in the telephone industry, but in any phase of selling. These qualities might well be called the *raw materials* of selling success.

Raw materials cannot do anything for themselves; they must be *used* — they must be fabricated into achievement. That is, an imaginative person does not profit until he puts his imagination to work on a concrete project.

Whenever we start to build or achieve anything another element comes into action. This is *skill*. Success depends both upon the possession and the development of personal qualities such as we have been discussing, and also upon the skill with which they are used. This leads us to the somewhat dubious word, *salesmanship*.

The "ship" of the salesman is the skill he employs in selling. Therefore, I feel that this series would not be complete and workable without a reasonably full treatment of this "ship." I hope no reader shies away from me on this account; I do not intend to become very technical or "scientific," but I do believe that a brief non-technical discussion of basic sales principles will be helpful.

Life is governed by principles. Principles never vary; only their application varies to meet the special and unique requirements of a particular situation. The principles governing the sale of a telephone subscription vary in no way from those governing the sale of anything else—no more than one would need a special set of personal qualities to sell the telephone and another set to sell something else.

A good beginning of this discussion would be to point out what salesman*ship* is *not*. It is not the outsmarting of the other fellow, or the imposing of one will upon another to make the prospect buy something he does not want. Far too many treatises on selling seem to imply just that conception.

Skillful Selling Requires Constructive Strategy

There is *strategy* in skillful selling, of course, but it is the constructive strategy of making the best of your values and appeals, and not the destructive strategy of overpowering the other fellow. This can be done in some cases but it is always extremely difficult, and no one ever gets rich at it or goes to bed at night with the warming conviction that he has done a day's work useful to society.

Many people are reluctant to attempt selling because they do not clearly understand just what the process involves. They have a hazy idea that it involves some sort of extra-human process; something outside the routine comfortable contacts of life. Thus they take on a different personality; they become tense and self-conscious, and are under a strain that becomes obvious to the prospect and that wears down their morale.

That is why the movies are filled with "tired" salesmen every afternoon. They wear themselves out trying to be something they are not; trying to make artificial and difficult a normal human relationship that should be easy and natural.

This point is so important that it warrants a little elaboration. We willingly undertake work that is easy and comfortable, and shrink from work that is the opposite. Properly understood, salesmanship is easy. We practice salesmanship every day of our lives; we find it easy and normal because we do not look upon it as selling. Take a few examples:

When as a child you cut up a lot of kindling preparatory to asking your dad for a dime, you were selling—selling him the conviction that you were a deserving boy. The young man who goes courting, all shined up and on his best behavior, is simply attempting to sell the girl the idea that he would be a satisfactory husband. Whenever we get a job or win a promotion we make a sale; the candidate for office makes a sale if he is elected, the minister makes a sale when he wins a member to his church. Everyone is forever selling someone else—this is what keeps life moving.

Selling is merely the attempt of one person to get another to agree with him. I believe that the Smith family should have a telephone. I cannot force a telephone upon them; I can't make them subscribe merely because I wish it. In fact, I cannot *sell* them a blessed thing.

What I must do is to help them to *buy;* by giving them good and valid

XUM

The first principle of selling is always to offer your prospect an advantage.

reasons—reasons they will accept—why they should buy. A better definition of the process of exchanging values might, therefore, be "buymanship."

The First Principle of Selling

When we wish someone to do as we wish, to induce them to agree with us, we strive to give them valid reasons upon which they may base a positive decision or conclusion. This brings us to the first principle of salesmanship, which has already been presented in this series in the Buying Motives (TELEPHONY of June 1, 1940). We repeat them here in order to achieve a complete sequence of the easy selling formula to be set up.

You will recall that people buy in order to satisfy one or more basic human motives—profit, convenience, safety, pride. If you thought about these *buying motives* as well as read about them, you agreed that they are the mainspring of all action.

This first principle of salesmanship is transparently simple and obvious: The prospect *must* be given a reason-why he should do anything, including the act of buying. Yet we can go out into the street today and find salesman after salesman "dropping around to see if you are in the market," to ask, "Do you need any such-and-such today?" or to announce that, "I'd like to interest you in this-and-so," and even, "You don't need any gadgets today, do you?"

In the name of logic and commonsense *never* ask anyone to buy anything without giving him a *reason-why* he should buy in order to serve his own interest. That is the first law of salesmanship, conformity with the first principle; and a moment's study will disclose why this must be so. Someone in the back row rises to observe that he never heard of these buying motives and is nevertheless a salesman. I have seen pretty good fiddlers who did not know a note of music.

What such a rule-of-thumb salesman does is to search for people who already want what he offers, or who are obliging enough to figure out for themselves a profitable use for it. That is a pretty lean way of life. A far better, more profitable, and easier way would be to *create* the desire to buy by appealing to the interest of the prospect. The rule-of-thumb salesman is the one who receives the rebuffs and who is always conscious of that trade term "sales resistance." Let's have an illustration:

"Mr. Smith, I've come to see if you wouldn't like to have telephone service," says Mr. Rule-of-Thumb; or more service, or a new service, etc. Mr. Smith, along with everyone else, is constitutionally against buying anything for which he heretofore has felt no need. Therefore, he raises a guard, and more often than not he makes a snap decision against buying which must be overcome or reversed before the sale may proceed.

Here is some *strategy* of salesmanship: The skilled salesman knows that a negative reaction or decision is a delicate and difficult thing to deal with. People are stubborn; they resist the reversing of a decision even after they are privately convinced that it was wrong. One's decisions are a part of himself—his independence and dignity, and his ego suffers if he must reverse it. So the skilled salesman carefully avoids the opportunity for these snap negative reactions or decisions.

Instead, he phrases his tender in such way that the prospect becomes *curious* to hear more. For example, "Mr. Smith, telephone service (or more service) would make more money for your business." Or, "Offer many advantages that would be of real value."

Mr. Smith cannot make a snap negative decision here, because he doesn't yet know what these profits or advantages are, and certainly he does not object to profits or advantages as a general proposition. So he will lend an interested, or at least curious, ear while they are detailed. And if the detailing is convincing, he is not burdened with a previous negative snap decision which would have to be reversed.

The first principle of selling is always to offer your prospect an *advantage*. This also takes care of the first principle of salesman*ship*, which avoids an initial negative decision that must be reversed.

The Second Principle of Salesmanship

When you offer the prospect an advantage or profit in order to gain his attention and interest, you automatically incur the obligation to *prove* to him that he can enjoy them. Thus, if you tell Mr. Smith that a telephone will insure more profit in his business, you must be ready to tell why—not in broad generalities, because Mr. Smith is thinking specifically.

For example, you notice that Mr. Smith's calls are increasing, indicating a growth in his business. Perhaps he should have another line; it is quite possible that his outgoing calls may sometimes interfere with customers' calls, which would be undesirable, especially with a service business or one subject to stiff competition.

No attempt is to be made to detail all the advantages that telephone subscribers or prospective subscribers may enjoy, for the telephone manager, thinking as a salesman, can far more readily enumerate these—we are dealing with *principles* which may be adapted to the specific conditions that exist in the community and with regard to the needs of the individual subscriber or prospect. The essential step, therefore, when an advantage has been offered is to *prove* it. As stated, this proof must be specific.

Professional salesmen have been known to complain that they "gave the prospect everything in the shop," but still he did not buy. In such case it must be evident that the prospect did not accept the proffered proof. A proof acceptable to the salesman may not be accepted by the prospect. It must be accepted if it is to be of effect, of course. Therefore, the salesman must always find out—first, if he has made a valid appeal and, second, if his proof has been accepted.

The way to find out is to ask. Suppose, for example, you have given Mr. Smith a reason why he should subscribe — a reason based upon what you consider would be an effective buying motive in his case. He has listened and perhaps may agree, which may wind up the sale right there.

But on the other hand he may be noncommittal; he may have in his mind what he considers an equally valid reason for not subscribing. If

(Please turn to page 52)

SMALL EXCHANGES

Can Be Made Dividend-Paying

By H. R. BURR
President, South Dakota Telephone Association

IT CAN BE DONE — and this story portrays how a small Independent company built up from a condition where bare operating costs were difficult to meet, to a dividend-paying basis with excellent service and rates. (Address given before South Dakota telephone convention)

IN 1937, the management of the Western Telephone Exchange was placed in my hands. At that time, it was one of the many Independent telephone companies operating without profit—in fact, it was a problem each month to meet operating costs.

My first job was to find out what was wrong with the business. It didn't take long to find out that poor management, over a period of years, had much to do with the situation ($46,000 on the books in uncollected rentals).

Rural lines were in such a state of disrepair that it was necessary to rebuild every line; some of the lines weren't in use at all, as many telephones had been removed during the depression. These old lines were torn down; those poles that had not been used for fire-wood or fence building, were utilized in rebuilding our lines.

Sixty miles of line were not in use, but taxes were being paid on them—taxes also being paid on lines that had never existed. This necessitated drawing a new plat of our lines and appearing before the county commissioners to get an abatement and refund of taxes.

At times the job seemed a hopeless task. After reconditioning the lines and giving our patrons good service, I decided that an increase in subscribers, as well as in rates, was necessary.

I decided to have the rural subscribers pay $1.50 monthly, instead of $20 yearly, while money was scarce. Letters were written to that effect and contracts were prepared for them to sign. I believed this plan would encourage them to keep their telephones; it would be easier for them to pay a small amount than a large one and enable them to pay a little each month on back accounts.

"It is my opinion," says MR. BURR, "that there is not one exchange in this state that cannot be turned into a dividend-paying enterprise."

By 1939, we had an increase of 10 per cent in subscribers. The next step was to find a way to increase the rates and at the same time hold the goodwill of the subscribers. To do this, I was thoroughly convinced that we had to show a willingness to give as well as to receive: If we could promise a susbcriber the latest telephone equipment and a more efficient service, we would meet with little opposition.

We have two telephone exchanges, one at Orient, equipped with 100-drop magneto switchboard and serving 112 subscribers. Our other exchange at Faulkton, with a 300-drop two-position board, served 294 subscribers with three regular operators and one relief, giving 24-hour service.

Neither exchange was paying operating and maintenance costs. After much figuring and planning, I decided that the dial automatic was the only solution in placing these exchanges on a paying basis. So arrangements were made for installing this system in both exchanges.

I went, personally, to every subscriber in both localities with a petition, driving almost day and night in my old Chevy. The 15 years of experience that I had selling prunes over the counter and goods on the road, I can assure you, came in pretty handy, for I had to sell the proposition to some of the most hard-boiled people I have met. And I did some talking! My lineman was with me on several occasions when I tackled patrons who would swear that no one could convince them. But I either talked them out or wore them down, until they signed for the dial automatic service. The result justified the means, as I was able to get 90 per cent of all my subscribers to sign up.

Then I had to go to the state public utility commission with my petition and figures, showing valuation of plants and equipment to justify the increased rates. This met with the commission's approval, and I proceeded to go ahead with my plans to purchase new equipment. Our new rates will allow us a reasonable depreciation on plant and equipment and a reasonable percentage on investment.

It is my opinion that there is not one exchange in this state, that cannot be turned into a dividend-paying enterprise if the men who are responsible for its welfare, will make up their minds to succeed. It will not be easy. It will take long hard hours each day, and it may take many months to complete your work.

There will, perhaps, be some discouraging times ahead of you, but if you will stick with it, you can't help but succeed. I can assure you that your success will be worth,

(Please turn to page 49)

XUM

SWITCHBOARD REPLACEMENT AND

Conversion Problems

By EMMETT D. TALBOT, Fellow AIEE
Consulting Telephone Engineer, Rochester, N. Y.

***PRIOR TO UNDERTAKING** replacement or conversion to another type of operation, the management of a telephone company should have careful studies made of all elements entering into the job. An outline is given of some of the problems which may be encountered. (Paper presented before annual New York convention)*

THERE are available today three distinct types of telephone systems—magneto, common battery manual and dial. At some time during its operating life every telephone company is faced with either the replacement of its central office equipment, or with the conversion of an existing system to one of some other type.

The forces constantly at work which necessitate the consideration of the problems pertaining to replacement or conversion may be defined in the broadest terms as *obsolescence* or *inadequacy*. An existing system may be obsolete but not inadequate, or it may be wholly inadequate but not obsolete. Regardless of the reasons that make it necessary to replace or to convert an existing system, the problems incident thereto must be faced.

A company should not be stampeded into a replacement or conversion of its existing system by any of the many forces advocating change, which on the surface indicate that a more modern type of equipment should be provided, until a most careful consideration is given to all the elements that enter into the problem. In the final analysis cost should generally be the determining factor on which the decision is based. It is true that conversions of both magneto and common battery systems to dial operation have been made in which the cost was not given much consideration, with the result that later it was learned that the conversion was, to put it mildly, somewhat premature.

If and when the replacement or conversion of an existing system arises, what are the problems that must be faced and solved? From a first cost consideration only, generally a replacement will require less dollars than a conversion. Therefore, if only the first cost is taken into account a true picture of the problem will not be obtained; and any decision to replace or to convert that is based on first cost only will, like Hamlet's Ghost, rise up to disturb you as time goes by. In other words, we shall only be fooling ourselves.

"Regardless of the reasons that make it necessary to replace or to convert an existing system," says MR. TALBOT, "the problems incident thereto must be faced."

In order to determine whether it will be more economical in the long run to replace an existing equipment with a more modern equipment of the same operating type, or to convert the existing system to some other operating type, carefully-prepared studies should be made of all the elements entering into the problem. This study will consist mainly of a comparative cost estimate so set up as to reflect all of the variations entering into the systems under consideration. Then and then only can the management safely decide whether a replacement or a conversion should be undertaken.

The comparative cost estimates should be prepared from a neutral standpoint, dealing only with facts so far as facts can be obtained. It is true that there are some angles in both replacement and conversion problems that must be set up on the basis of estimates. Such estimates, however, should be based on sound experience, past performance and the best possible judgment regarding the future requirements.

The first major problem is to determine whether the existing equipment is to be replaced or to be converted to some other type. After this has been decided, then the actual mechanics of providing the new system can be undertaken. If a replacement is to be made, the work to be done in installing the new system is, of course, much less complicated than it will be if a conversion is decided upon.

There are a number of items of plant, the cost of which will be the same for replacement or for conversion. For example, assume consideration is being given to the replacement or conversion of a common battery system. If the existing plant has been well maintained, no major expenditure will be necessary to fit the plant for dial operation. This does not include the cost of any rearrangement of the plant that may be necessary due to a change in location of the central office, or any new plant that may be needed to take care of station growth.

If a magneto system is to be converted to either a common battery

XUM

SUMMARY

COMPARATIVE FIRST COST, ANNUAL CHARGES AND OPERATING EXPENSES

MANUAL AND DIAL SYSTEMS

_____ TELEPHONE COMPANY

_____ OFFICE

DATE _____

Item No.	First Cost			Initial Period 19__ Manual	Initial Period 19__ Dial	First Addition 19__ Manual	First Addition 19__ Dial	Second Addition or Ultimate Manual	Second Addition or Ultimate Dial
1	Land								
2	Building								
3	Manual Central Office Equipment								
4	Dial Central Office Equipment								
5	Outside Plant Construction								
6	Subscribers' Station Apparatus - P.B.X.								
7	Total First Cost Installed								
	Annual Charges								
10	Land and Buildings	at	%						
11	Central Office Equipment	at	%						
12	Outside Plant Construction	at	%						
13	Subscribers' Station Apparatus	at	%						
14	Total Annual Charges								
	Operating Expenses								
15	Floor Space Central Office Equipment		*						
16	Operators' Salaries and Taxes		*						
17	Central Office Maintenance		*						
18	Central Office Lighting and Power		*						
19	Outside Plant Maintenance		*						
20	Subscribers' Station Maintenance		*						
21	Amortization - Non-Recurrent Expense		*						
22	Amortization - Plant Retired	(1)	*						
23	Carrying Charges - Spare Parts		*						
24	Total Operating Expenses								
14	Total Annual Charges								
25	Total Annual Charges & Operating Expenses								
	Saving or Loss over Manual								

	Office Traffic Characteristics					
	Initial		1st Addition		Ultimate	
	Manual	Dial	Manual	Dial	Manual	Dial
Terminals						
Lines						
Stations						
Orig. B.H. Calls						
Orig. B.H. M.T.						
Inc. B.H. Calls						
Inc. B.H. M.T.						

* Items marked * are excess not totals.

(1) Unaccrued Depreciation.

Typical summary sheet to illustrate the procedure of setting up a comparative cost estimate. It covers items of cost generally included in studies of equipment for use in single office areas to determine whether replacement or conversion should be planned.

manual or to a dial system, there will generally be an item of cost covering the rehabilitation of the outside plant in order to bring up its condition to the standard required for common battery or dial operation.

Space does not permit a discussion of the replacement and conversion problems that may be expected to be encountered in connection with all of the types of operating telephone systems. In general, telephone systems fall into one of the following classes:

(1) Magneto systems, ranging in size from 20 to 200 lines. These may be either replaced by magneto or converted to common battery or dial. The tendency today is to convert the small magneto system directly to dial operation.

(2) Common battery systems, operated in single-office areas and ranging in size from as small as 100 lines up to 4,000 or 5,000 lines. In this class more problems have to be considered than are met with in class 1.

(3) Small multi-office areas now being served by common battery systems, ranging in size from two to four central offices, each office having in the order of up to 5,000 lines per office.

(4) Large multi-office networks, having a number of 10,000 line capacity central offices.

The replacement and conversion problems encountered in connection with the foregoing four classes of systems increase as we advance from class 1 to class 4. With the latter the problems not only become numerous but extremely complicated.

The first problem to be solved is whether the existing system should be replaced or converted to some other type of system. The same general procedure is followed in order to determine which plan, replacement or conversion, should be undertaken. It is most important to the company management to have as complete a comparative cost estimate covering the replacement and conversion of the existing system as it is possible to prepare. All of the problems that will be encountered in both replacement and conversion should be included in the study. The many elements entering into both schemes must be converted to cost. Cost in this case consists of:

(1) First cost of all labor and materials that enter into each plan.

(2) The annual charges on the first cost.

(3) The operating expenses applicable to the two or more systems being compared.

The final comparative cost summary should consist of:

(1) The total initial costs, including the cut-over expenses.

(2) A forecast of all the costs, including the annual charges and operating expenses for at least a five-year period.

(3) A further forecast for the ten-year period; and if the problem deals with small or large multi-office networks, the costs should be extended to cover a 20-year period.

In most cases the comparative cost estimates can be somewhat simplified if the costs for those items of plant that will be the same under both plans are eliminated from the study. However, all costs should be included in the final estimate for the plan adopted. In some cases it may be found that the most economical plan in the very long run will require too large an expenditure in the initial period to make it the desirable plan to follow.

To illustrate the point of eliminating those costs that are the same for both plans, assume the replacement and conversion of an existing common battery system which will require in either plan a new central office location, and that X dollars will have to be spent to tie the existing cable plant into the new central office; and that regardless of the type of system installed, this tie-in cost will be the same for both plans.

In such cases this item of cost may be left out of the comparative cost estimate. However, it must be considered in the final analysis of the dollar requirements. This is but one item of cost of several which will be found to be the same regardless of the type of system proposed.

The many problems that will be encountered in connection with a re-

XUM

placement or a conversion cannot be reduced to the common denominator, *dollars*, until considerable planning and engineering have been done. The principal problems that will be met in connection with replacement and conversion in about the order in which they should be solved are:

(1) LAND AND BUILDINGS: If our problem is concerned with a magneto or a small common battery system, the existing equipment may be housed in either rented or company-owned quarters. Regardless of the kind of housing facilities in use, a housing problem presents itself in comparing replacement and conversion costs.

Generally, building costs will be different for common battery and dial equipment. If no manual equipment is to be considered in the dial plan, then a different type of building can be used for the dial equipment than would be suitable for the common battery equipment. This phase of the problem should be given careful consideration and the results reduced to cost. There are cases where dial equipment has been installed in the same building that housed the system being replaced with no added floor space being required. However, as a general rule, it will be found that the two types of systems require different treatment so far as floor space requirements are concerned.

Again, the problem may be further complicated by the fact that under the conversion plan some manual equipment will be necessary, generally for toll operating use. This may result in about even costs for floor space, but will increase the operating costs under the conversion plan for the toll portion of the operating expense as compared with the toll operating cost under the replacement plan.

(2) CENTRAL OFFICE EQUIPMENT: Before the amounts of central office equipment can be determined, either for replacement or for conversion, important data must be obtained, assembled and analyzed. These data are commercial statistics relating to the realized growth in stations and a forecast of the expected growth in stations for a reasonable number of years in the future. The fundamental traffic data must be compiled for use in calculating the quantities of equipment needed to meet the commercial and traffic expectations.

The commercial data has to do with the number and class of lines, stations and special services for which facilities must be provided for the initial period, plus some extra capacity to take care of the growth for at least two years, and the forecast commercial requirements in convenient steps to the ultimate period.

The fundamental traffic data has to do with lines and stations, calling rates and holding time, average total originating traffic for the busy hour and the total day, and the distribution of the originating traffic. These traffic data are of the utmost importance and should be as accurate as it is possible to obtain, since the quantities of central office equipment are calculated on the basis of these data. All traffic data should be free from guessing, and this is particularly important in connection with a conversion to dial operation.

The distribution of the originating traffic is of vital importance, especially in multi-office areas. All guesses should be eliminated in connection with traffic data. Accurate holding time data should also be obtained. Such data can be obtained by carefully made stop-watch observations; but to be reliable and to represent the average, the observations should be made over a considerable period of time in order to obtain sufficient data to give the average.

Holding time data may be obtained by making simultaneous plug and peg counts during the busy hour. A sufficient number of busy-hour counts should be made to insure the accuracy of the average holding time data. Traffic counts and the methods followed in obtaining accurate data are broad subjects and can only be mentioned briefly in this discussion.

In order to emphasize the importance of the traffic data, assume our problem concerns the replacement of a common battery system or the conversion to dial. If the present common battery equipment is replaced, the size of the equipment must be determined. With manual equipment greater flexibility is obtained than with dial equipment.

To illustrate: If our switchboard consists of, say, five to ten operators' positions, each equipped with 15 or 17 cord circuits, greater fluctuations in traffic peaks can be handled without serious service reactions than would be possible with dial equipment. In other words, a competent operating force can handle traffic peaks above the average with the 15 to 17 cord circuits per position and efficient teamwork more readily than can be done in a dial system.

My point is that in the dial system there is no teamwork possible between separate groups of lines, and in order that the right number of switches are provided to handle the average busy-hour calls, the traffic data on which the switch calculations are based should be as accurate as possible to obtain. Otherwise, you may be providing excess equipment on which you are paying carrying charges not warranted, or there will not be enough equipment, which means inefficient service.

Having set up the fundamental traffic data, the next problem is to determine the amounts of equipment required. In the replacement case, this means lines of equipment, operators' positions, frames, racks, desks, etc. In the dial case it means line equipment, finder switches or links, or selectors, depending on the type of dial system being considered. Then the quantities of the various switches in the switch train, ending with the connectors or final switches, with frames, racks, desks, etc. This will include trunk groups to handle local, inter-office, special service and toll service.

In multi-office areas both manual and dial systems require careful engineering (both traffic and equipment) in order to determine the amount of equipment required to meet service needs. In multi-office areas there will also be the cost of the equipment to take care of the traffic between the dial and the remaining manual offices. When this work is completed the results can be reduced to first cost installed.

If the problem involves the replacement of a common battery system or the conversion to a dial system and a toll switchboard is required in each plan, our problem becomes more complicated. In the replacing plan a combination local and toll switchboard would be provided; while in the dial plan it would be necessary to provide a separate toll switchboard.

A separate toll switchboard, in addition to affecting the floor space requirement, would increase the cost of the equipment to be provided over what similar toll switchboard facilities would cost under the replacement, as mentioned under "Land and Buildings." A separate toll switchboard operated in conjunction with a dial equipment will generally result in a higher traffic cost per toll line unit than the traffic cost would be under the replacement plan.

(3) TELEPHONES: The cost of telephones must next be considered. In the replacement plan there would

(Please turn to page 48)

XUM

Elements of Telephone Sets

By HARRY CHAPMAN

BECAUSE THERE ARE available no recent books covering the parts of the telephone set with explanations of the theory of their operation, this series of articles has been written for study by newcomers in the field. It is the author's hope that some telephone workers, by studying these articles, may become better fitted to fill their jobs and thereby place themselves in line for advancement. This first instalment is devoted to magnetism

BEFORE MAKING a study of telephone receivers it is well to discuss permanent magnets and electromagnets. We know that a permanent magnet has a north and a south pole and that magnetic lines of force flow from the north pole to the south pole.

To prove the presence of these lines of force take a "horseshoe" magnet and place a thin piece of cardboard over the poles of the magnet as shown in Fig. 1-A, and upon the cardboard sprinkle fine iron filings. Gentle tapping of the card will cause the filings to form in lines describing the path taken by the lines of force. The pattern of these lines of force can be traced by a small compass. If the compass is moved about, the lines can be traced and the direction in which they flow will be indicated by the compass needle.

It is also true that a conductor carrying a current is surrounded by magnetic lines of force. This can be proved by taking a card and passing a conductor through it as in Fig. 1-B. Sprinkle the card with fine iron filings. As the conductor is connected to a source of current, such as a battery, tap the card. The filings will form the pattern taken by the lines of force around the conductor.

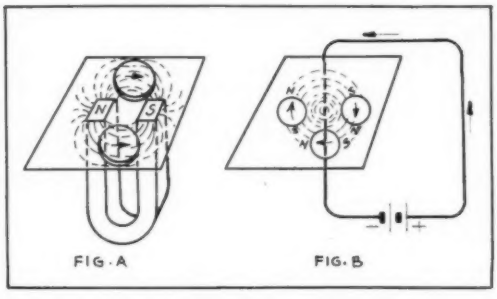


Fig. 1. Magnetic Lines of Force.

These lines can also be traced by the use of a compass, as shown in Fig. 1-B. As the current is flowing down through the card and the compass is placed to the left of the conductor, the needle will point away from you, while if the compass is placed to the right of the conductor the needle will point towards you.

In other words, if the compass is moved around the conductor the needle will point in a direction at right angle to the conductor, proving that the lines of force flow in a circle around the conductor. The direction in which the needle points is dependent upon the direction in which the current is flowing in the conductor. If the current in Fig. 1-B were flowing "up" through the card, the needle would point in a direction opposite that shown.

The direction of the lines of force around a conductor can be determined without the aid of a compass by what is known as the "right hand rule," illustrated in Fig. 2. To use the "right hand rule" grasp the conductor in the right hand with the fingers around the conductor and the thumb pointing in the direction of the current flowing in the conductor. The fingers will then indicate the direction of the magnetic flux or lines of force around the conductor. These lines of force radiate in circles from the conductor in much the same manner as waves spread out from the spot where a pebble has struck the surface of a body of water.

If a length of insulated wire were wound into a coil and connected to a battery as shown in Fig. 3-A, and a compass placed inside the coil the compass needle would point in one direction. However, if the compass were placed near the coil on the outside, the needle would point in the opposite direction. This is explained by the arrows in Fig. 3-B.

If the same coil were cut in two and the ends of the turns marked "plus" indicated that the current was flowing away from us, and the ends marked "minus" indicated that the current was returning toward us, then application of the "right hand rule" would prove that each turn had a magnetic field around it in a clockwise direction at the "plus" end, and in a counter-clockwise direction at the "minus" end.

As these magnetic lines expand or radiate from the conductor they come in contact with the next turn, meeting its magnetic lines coming up from the inside. This meeting causes the outer lines of force from the first turn to flow around the outside of the second, third and fourth and all the other turns until they come to the end of the coil. Meeting no more opposition the outer lines of force then flow around the last turn to the inside and through the coil to the other end and out again.

This is true with all lines of force of each conductor which radiate far enough from the conductor to come

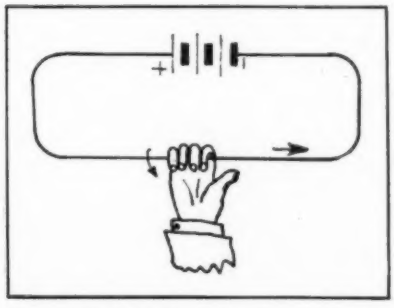


Fig. 2. Right-hand rule for determining the direction of magnetic lines of force around a conductor carrying current.

XUM

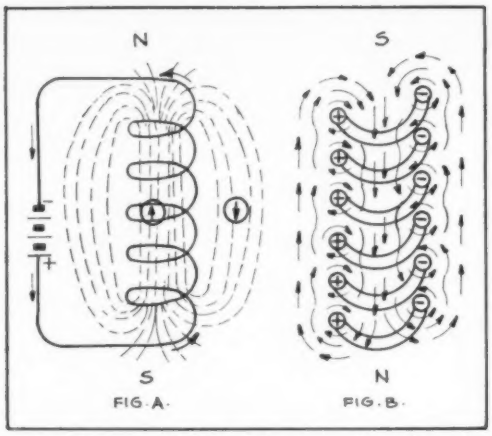


Fig. 3. The magnetic lines of force around a coil carrying current.

in contact with the other turns. These magnetic lines of force flowing around the entire number of turns are called a magnetic field.

If a core of soft iron were inserted inside the coil, as long as current is flowing through the coil the core would become an electromagnet. As soon as the current is cut off the lines of force would disappear and the coil would no longer have any magnetic effect. Since these magnetic lines of force flow from one end of the coil to the other it becomes magnetically "polarized"; that is, it has a north and a south magnetic pole and complies with all rules of magnetism.

The polarity of the coil can be determined by again using the "right hand rule." Grasp the coil in the right hand with the fingers around the coil pointing in the direction of the flow of current and the thumb extended at right angle to the palm of the hand. The thumb will then indicate the north pole of the coil as shown in Fig. 4.

Electromagnets have many of the same properties of a permanent magnet except that current must be applied to create an electromagnetic field, while in a permanent magnet the magnetic field is there constantly, after having once been charged by exposure to some strong magnetic field. A permanent magnet is made of very hard steel while the core of an electromagnet is made of soft iron to be more responsive to the magnetic lines set up by current in the coils of wire wound around it.

The electromagnet shown in Fig. 5-A has two coils. The one on the left is wound in a counter-clockwise direction while the one on the right is wound in a clockwise direction. If positive current is connected to the No. 1 coil end lead and the current flows around the core in a counter-clockwise direction, application of the "right hand rule" (Fig. 4) for electromagnets, shows that the lower end of the left-hand coil is a north pole.

Since the same current flowing through the left-hand coil also flows through the right-hand coil but in the opposite direction, application of the "rule" to this coil shows that its lower end is a south pole. Since the two cores are connected at the top by a steel bar, the two cores are, magnetically speaking, in series, the same as a permanent magnet.

Assume that with a given amount of current this electromagnet is powerful enough to lift a five-ounce steel bar, and that the permanent magnet is strong enough to also lift a five-ounce steel bar, as shown in Fig. 5-B. Remove the soft iron core from the electromagnet and place the permanent magnet in the coils

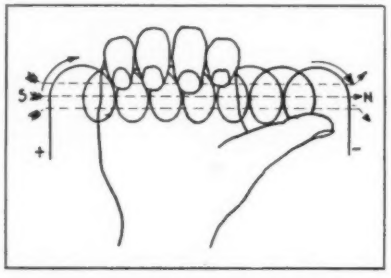


Fig. 4. The right-hand rule for coils.

instead, with the north pole of the permanent magnet inside the left-hand coil and the south pole in the right-hand coil. Using the same amount of current as before, with positive current connected to the No. 1 coil lead and negative current at the No. 2 coil end lead as in Fig. 5-C, we should then expect the combined permanent magnetic force and electromagetic force to be able to lift a ten-ounce steel bar.

Since the left-hand leg of the permanent magnet is a north pole and our rule indicated that the lower end of the left-hand coil (with positive current connected at No. 1) was a north pole and the opposite coil produced a south magnetic field at its lower end, the two forces would be working together.

Using the same amount of current as before but reversing the direction of current flow by connecting positive current at No. 2 coil end and negative current at No. 1 lead, the electromagnetic field would be reversed. However, the permanent magnetic field would remain the same as before, since the two forces separately were of the same power, namely "five ounces."

With the current flowing in the opposite direction the lower end of the left-hand coil now becomes a south pole and the lower end of the right-hand coil becomes a north pole. Therefore, with these two equal forces working in opposition to each other, we should expect no lifting power whatever (Fig. 5-D).

This is the theory upon which a telephone receiver operates and these principles should be studied carefully. Later, we shall take up a discussion of receivers.

Nine Months' Net Income of United Utilities Gains

With a net income of $296,765, United Utilities, Inc., reported a gain of $37,510 over 1939 for the first nine months of 1940. Gross income of the company, which owns a number of subsidiary operating telephone companies, was $3,342,550 for the nine-months' period, compared with $3,192,022 for the same period of 1939.

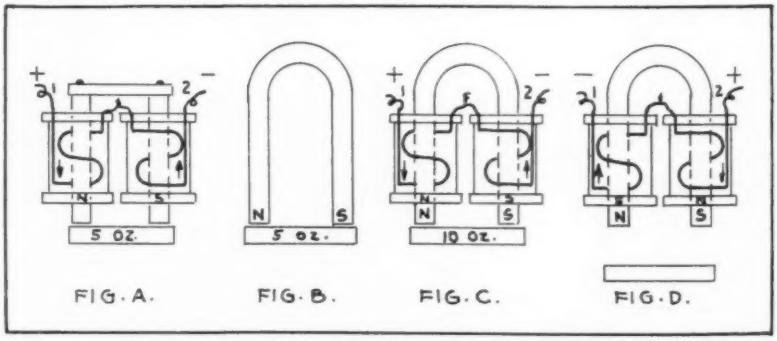


Fig. 5. How two magnetic fields may aid or oppose each other.

***WORKING WITH THE FARMER** to furnish more rural families with telephone service, the Southern Bell Telephone & Telegraph Co. has developed a rural program for its territory. This article presents the major factors in*

Streamlining Rural Service

FOR SOME TIME the proposed expansion of telephone facilities to serve a larger rural public has been actively studied by the Southern Bell Telephone & Telegraph Co. The object to be attained has been to provide more rural families with telephone service, irrespective of whether it was to be furnished wholly by the Southern Bell company or to be furnished jointly by the company and the farmer.

In the former instance, ways and means were studied to furnish standard Bell service at rates which many rural dwellers could afford to pay, and yet to furnish the service on a basis which was economically sound. In the latter instance the purpose has been to develop even better ways and means to lend a helping hand to the farmer, who now has, or needs, service on a farmer's line.

When the studies were concluded the plans and procedures developed were reduced to a practical experiment which proved the fertility of the market, and the soundness of the plans. As a consequence, during the past several months an active program was begun in all of the nine states in which the Southern Bell operates. While its experience does not provide a panacea for all cases, the accomplishments so far do show that substantial progress has been made.

In general, the methods employed to develop the rural market of a typical section of the South were along the following lines:

An exchange was selected adjacent to which there appeared to be a need for additional telephone development. An employe of the company, called the "Rural Representative," surveyed all of the roads leading from the exchange and laid plans for conducting a thorough canvass of the sections considered logical for further development.

Then such key persons as the county agent, prominent merchants, public officials and heads of civic organizations were contacted and informed of the company's plan for extending its service along the various routes selected in the survey. The principal persons living along the route also were contacted.

The active cooperation of these persons was solicited and they were asked to become partners in the project of developing a more complete telephone service for the whole community.

One road was selected on which to start canvassing, to be followed by other roads until all of the logical service area of the exchange had been covered by this so-called "sweep method."

On the farm nearly half the number of telephone calls are business calls. This is based on a recent survey of telephone calls made by families in farming areas scattered throughout a selected state. Social calls also ranked high in use of the telephone.

After the canvass the task became one of staking out the line, ordering the material, and providing the manpower to do the construction work. Usually, all of these functions were handled by the rural representative who, in essence, not only promotes the project but also provides the facilities.

Since the success of this plan of promotion depends to such a large extent upon the ability, the experience, and the judgment of the rural representatives, considerable care was exercised in their selection. They were chosen largely from among the installer-repairmen, engineers, construction foremen, salesmen, and group managers, and they were given a week's intensive schooling in the diversified aspects of their new work.

To men of this type was entrusted the full responsibility for each project from its inception to its completion.

In addition to this careful planning of the work, the essence of the program lay in the provision of the service at a minimum cost. Reasonable rates and all possible construction economies were the major factors in the consideration.

Another basic feature of the plan is the use of line wire of high tensile strength, permitting long-span construction, and more direct routes frequently located on private property, through the cooperation of the farmers.

Improved right-of-way clearing arrangements, modified engineering of the lines, and a general speeding up of all phases of the work, resulted in a streamlining of the whole activity.

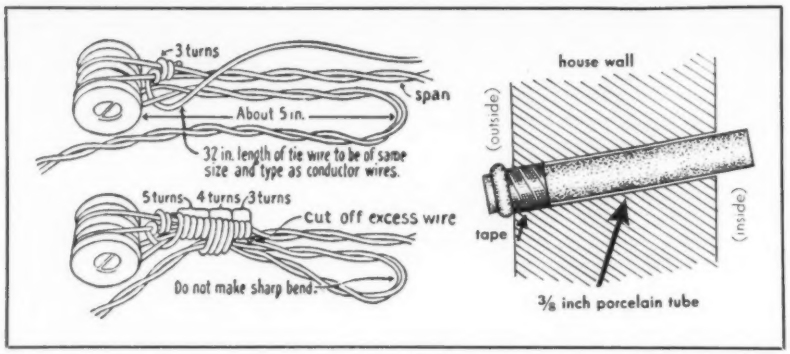
Another aspect of the program lies in the effort to assist in conserving a considerable number of existing farmers' lines, as well as getting new farmer-line customers in remote and sparsely-settled sections.

During the past few years, many existing farmers' lines have been rehabilitated by the farmers, oftentimes under the friendly direction and assistance of the Southern Bell company.

The improvement of the service in the smaller exchanges generally, coupled with the progress made in furnishing more rural homes with reliable service, and at a minimum cost, has been the basis of a broad program—to extend over a long period of years—to improve and extend the service in a systematic, business-like way.

The Southern Bell has taken a further step in its farm telephone program by issuing two booklets,

XUM



These illustrations of rural line construction methods, given in "farm" booklet, show correct methods of making drop wire deadends on pole where drop wire is connected to line wire. In taking line wire into house a porcelain tube should be used, installed as shown.

"How to Build and Repair Your Farm Telephone Line," well illustrated with photographs and diagrams, and "The Farmer's Friend," also illustrated.

"How to Build and Repair Your Farm Telephone Line," is a 24-page booklet attractively prepared and containing much information; it is 11¾ ins. by 9 ins. The information is presented in the form of conversation between a telephone man and a group of farmers who want to learn how to build farm telephone lines and how to keep them in good condition.

The telephone man explains to the farmers, as simply as possible, the importance of making tight splices, keeping wires from getting crossed and keeping the telephone current from leaking into the ground. Diagrams in the booklet show exactly how to attach brackets; how to attach wire to an insulator; how to pick out good poles; how to set a pole; how to string the wire (with a caution that state laws on roadway clearance should be observed); how to make a sleeve splice; how to protect the telephone from power line hum and how trees rob a line of current.

Full pages are given to the diagrams on how to connect drop wire to line wire; how to attach drop wire to the house; how to connect the house line to the telephone (using either two wires or one wire), and how to connect the ground rod.

The booklet concludes with a page of "Questions and Answers" and a page listing the "Materials Needed for a Farm Telephone Line."

The other booklet, "The Farmer's Friend," pictures a telephone on the front cover. It is about 5 ins. by 7½ ins. in size. Each page is devoted to an illustration depicting a different use of the telephone on the farm, together with timely comments.

The last page of this booklet presents an interesting illustration, which is reproduced on opposite page, showing the division of farm telephone calls. Business calls amount to 44.6 per cent; social calls, 35.2 per cent; household calls, 11.1 per cent; and miscellaneous calls, 9.1 per cent.

"With the cooperation of many families in farming areas scattered throughout a selected state, a recent survey of telephone calls revealed that nearly half of the total number of calls made were business calls," it is pointed out.

"Social calls also ranked high in the survey which is evidence of the fact that those farm families that have a telephone are able to enjoy a fuller and happier life on the farm."

▼ ▼

Rural Campaign Is Success at Lamberton, Minn.

A recent successful campaign for new rural subscribers conducted by the Northwestern Bell Telephone Co. at Lamberton, Minn., demonstrates the results which can be obtained from a thoroughly planned and efficiently executed program. The campaign resulted in 45 orders for rural telephone installations, and the names of 37 additional prospects.

As explained in a recent issue of Northwestern Bell, the company's employe magazine, the campaign was undertaken to regain telephones in the rural region around Lamberton which had suffered in recent years from drouth, poor crops, and low prices for farm produce.

Before the canvass was begun, a complete survey of the territory was made. The service area was made to coincide with the trade area of the territory insofar as possible, maps were prepared showing subscribers and non-subscribers, line fill studies were made, and new pole lines were planned.

The three salesmen, who were from the company's area sales organization in Minneapolis, were supplied with dial telephones so that they could explain the advantages of the company's new service. The men also carried literature prepared by the company's information department, emphasizing the advantages of telephone service to farm families.

The salesmen reported they found little criticism of the rates, or of the quality of the service. Most farm families had never given the telephone much thought. Many farmers expressed a desire for telephone service, if their neighbors could also be induced to subscribe. The salesmen found that the quickest and best results were obtained by talking to the farmer and his wife together. Often it was the wife who expressed a desire for telephone service.

The campaign recognized the need for a thorough investigation into the facts about the development, rates, facilities, and trade and service areas in each exchange. When conditions causing the unsatisfactory development were determined, a plan to remedy the condition was mapped out and a canvassing program was planned. This gave a picture of the job to be done, and the appropriate time to do it, what employes were to participate, and what supporting newspaper and pamphlet matter were to be used.

The campaign was planned by the local manager of the Lamberton exchange, C. R. Peterson, while the salesmen needed to carry out the canvass were furnished by the company's area sales department.

▼ ▼

Ohio Associated Sells $1,770,000 Bond Issue

Arrangements have been completed by the Ohio Associated Telephone Co. to sell the issue of $1,770,000 in 30-year first mortgage 3½ per cent bonds recently authorized by the state public utilities commission.

The bonds, which will be sold at 106, will be placed with the John Hancock Mutual Life Insurance Co.; the Equitable Life Insurance Co. of Iowa; the Massachusetts Mutual Life Insurance Co., and the Provident Mutual Life Insurance Co.

The proceeds from the sale are to be used to redeem at 107½ a like amount of 7½ per cent bonds due in 1966. The remainder of the cost of refunding will be defrayed by the company treasury.

XUM

The Operators' Corner

TAKING things for granted may be followed by a rude awakening. Series No. 423

By MAYME WORKMAN
Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

IF THERE is one hour of the day which seemingly passes more quickly than others, it is the lunch hour. Usually there are a few errands or a bit of shopping to do, so we seek an eating place where the service as well as the food is good.

One day the writer dropped in at a nearby drugstore to partake of a light repast before shopping for a pair of shoes. This being a big job she was hopeful the service would be prompt. Spying a vacant table she hurried to be seated, then glanced expectantly at each waitress, hoping she would come to serve her. A glass of water and unused napkin were at the opposite place of the table. Minutes passed, five, ten, and nothing happened. People coming in later were being served at other tables while all the normal thoughts of a vexed person raced through my mind.

Finally, accosting a waitress I asked, "Is anyone serving this table?" The waitress replied: "I thought your order had been taken," glancing at the napkin and glass of water.

Just another case of *taking things for granted*. No apology from the waitress for the prolonged delay. No courteous, "I am sorry you were kept waiting," in the parlance of the telephone operator when she discovers—or a customer informs her—he has been waiting a long time to be served. Not even a smile or friendly gesture, just a cold, "I thought your order had been taken."

While reflecting upon the quality—or lack of quality—of the service rendered and, before being served, a person took the place at the opposite side of the table. No courteous, "May I sit here?" or "Do you mind?" Just taking for granted that the writer would not object to her company—and she was wrong. First of all, she was not the type of person one would choose for a luncheon partner, and almost immediately she lit a cigarette and started blowing smoke in my face. Again, there was no polite, "May I smoke?" or "Do you mind?"

Two thoughtless people taking things for granted spoiled what might have been a delicious luncheon and a restful, refreshing 15 or 20 minutes of relaxation.

No doubt, regardless of all the instruction to the contrary, there are occasions when people in the telephone business take things for granted, too. A lineman takes for granted that his safety belt is in perfect condition—and a serious accident occurs. A chief operator takes for granted that the service rendered in her office is satisfactory to all subscribers—and a serious service complaint, or perhaps a series of them, awakens her to the fact that she has been grossly mistaken in her assumption. A manager takes for granted that all of his employes are happy and contented in their work—then a report to the contrary brings a realization that he has erred in taking things for granted.

The safest bet is to be alert at all times, and when there is the slightest doubt, investigate instead of taking things for granted.

COMING CONVENTIONS

Kentucky Independent Telephone Association, LaFayette Hotel, Lexington, December 3 and 4.

Texas Telephone Association, Texas Hotel, Fort Worth, March 19, 20 and 21, 1941.

Nebraska Telephone Association, Hotel Lincoln, Lincoln, April 8 and 9, 1941.

Questions from Illinois Operators

1. Is a report chargeable when an operator gives you the report that a family has reported they will be out of town for the day and you have a call for a certain person in the family?
2. After a connection has been established, when should we say "Ring" and when do we say "AG" to reach the distant operator?
3. When you give an operator a DA report on a long distance call and she asks you to keep ringing, how many times should you ring?
4. If a conversation begins at two minutes before 7:00 p.m. and ends at 7:01 p.m. should you use a day rate of the night rate?
5. After you have waited your five minutes on an NCO and the distant operator tells you to release the circuit, will she call you or do you have to request her to call you?

The answers to these traffi questions are given on page 58.

▼ ▼

Football Photos Attract Crowds to Company Office

For several years the commercial department of the home office of the Lincoln (Neb.) Telephone & Telegraph Co. has specialized in window displays featuring photographs of past members of the Cornhusker football squad, singly and in groups. Gathered from various sources, the collection has grown to the point where hundreds of persons are attracted. The University of Nebraska football teams for 40 years have been rated high in the national annals of the sport.

The display this year is of historical value because of its completeness. It is built around the theme, "Husker Football Since the Turn of the Century," and the advertising tie-in stresses the fact that the company and Cornhusker football achieved national recognition with the turn of the century, and since. Nearly all available window space of the downtown office is taken up by the action and squad pictures.

▼ ▼

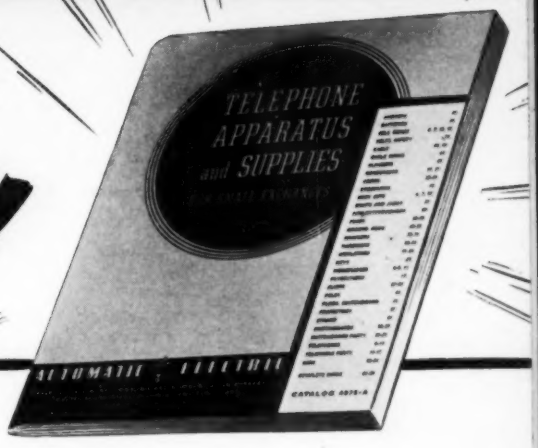
"Telephony" Story Makes Sunday Feature Section

A story in TELEPHONY formed the basis for a drawing by Cartoonist Harry Keys of the Columbus (Ohio) Dispatch recently in his colored Sunday page, "We Folks." The item, published in TELEPHONY'S issue of September 28, reported that linemen had been injured when their spurs contacted tacks which had been placed on poles to hold campaign placards. A telephone man called the story to the attention of Cartoonist Keys, who illustrated it with a sketch and added the suggestion that this was "a danger worth remembering in the next campaign."

XUM

PUT THIS BOOK TO
USE THESE PRODUCTS FO
MAGNETO TELEPHONES
MAGNETO SWITCHBOARDS

WORK FOR YOU



It's brim-full of products which will help you give better service and earn more revenue.

Here's a catalog devoted exclusively to the needs of the small exchange—with prices. In it you will find everything needed for modern small exchange construction, operation and maintenance—products which have been carefully selected as being better values for your money, and resulting in improved service to users, classified in sections as listed below:

MAGNETO TELEPHONES:—bring to the rural user the beauty and convenience of truly modern design.

MAGNETO SWITCHBOARDS:—of outstanding value incorporating all latest operating improvements. Built to withstand tough, hard wear year after year.

EXCHANGE ACCESSORIES:—include testing equipment, ringing machines, repeating coils and other time- and money-saving products for small exchange operation.

C-A-X's (COMMUNITY AUTOMATIC EXCHANGES):—automatic switchboards for small exchanges with a wide range of desirable features at new low cost.

SANDS PROTECTION EQUIPMENT:—incorporates exclusive advantages in design and construction which insure complete protection against lightning and stray currents of all kinds.

TELEPHONE SUPPLIES:—of highest quality, designed specifically for telephone use. Prices are rock-bottom due to our large purchasing power.

If you haven't received your copy of this catalog No. 4075-A, send for it today! The more you use it the bigger will be the dividends you receive in full value and complete satisfaction. Why not start making it work for you—at once?

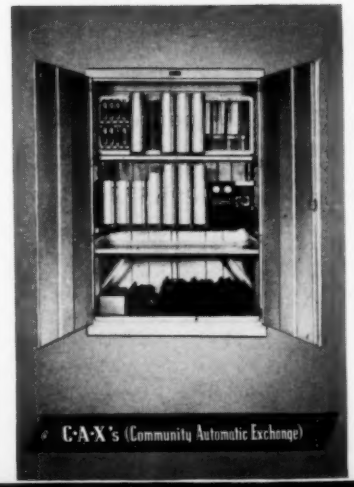
AUTOMATIC ELECTRIC

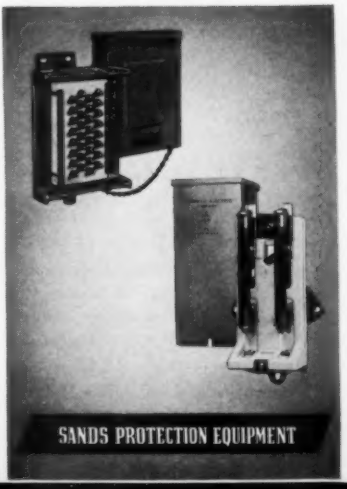
MAKERS OF TELEPHONE, SIGNALING AND COMMUNICATION APPARATUS
ELECTRICAL ENGINEERS, DESIGNERS AND CONSULTANTS

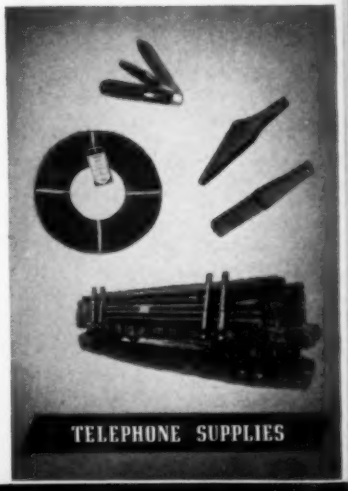
Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY, 1033 W. Van Buren St., Chicago, U. S. A.
Export Distributors: AUTOMATIC ELECTRIC SALES COMPANY, LIMITED

FOR BETTER PERFORMANCE—GREATER SATISFACTION!

EXCHANGE ACCESSORIES


C·A·X's (Community Automatic Exchange)


SANDS PROTECTION EQUIPMENT


TELEPHONE SUPPLIES

XUM

IDEAS AND SHORTCUTS

for Plant and Exchange

By RAY BLAIN

What is your "pet kink" or best method of doing a certain job? Why not tell others through this department?

The Lashing Method of Cable Suspension

The accompanying illustration shows the new lashed method of aerial cable suspension. The cable is lashed direct to the messenger with wire and no rings of any kind are used. Even splices are lashed direct to the messenger without any special hangers. This lashing is applied by a machine called a "spinner" which is set on the messenger at one pole and pulled to the next in the lead.

While we are all probably prone to criticize new things, the fact that cable has a tendency to twist around the messenger in long spans is objectionable to some. It remains to be seen whether this twist will in time cause trouble. It is claimed that this new lashing method prevents ring cuts and that creeping does not occur even though grade clamps are not used.

In the "lashed" method, aerial cable is lashed to suspension strand by wire, no hangers being used.

New Earth-Boring Machine

There has been a need for a long time in the telephone field for a cheap, light-weight, earth-boring machine for the digging of pole holes. With this objective in view considerable development work has been performed on a small earth auger to operate on a shaft extension from the winch of a regular line construction truck.

It is lighter in weight and lower in cost than the machines used by the larger companies, which probably places it within reach of many of the smaller telephone companies. The small machine is easily spotted at holes since the truck used for its operation may be merely driven along the road and need not be placed at right angles to the road at each hole location.

Light-weight earth-boring machine operated on a shaft extension from winch of construction truck.

Strap Method of Pole Stubbing Proves Efficient

A good kink on a new method of pole stubbing comes from Maurice G. Staton, of the West Coast Telephone Co., Forest Grove, Ore. Mr. Staton says: "For years it has been our thought that there should be some easy, quick and cheap method of pole stubbing. It is quite apparent that little improvement would be possible in the actual placing of the stub itself. The conventional stubbing methods, although easily accomplished, do require considerable time, and the material necessary represents a greater part of the stubbing costs.

"During the past year we have been stubbing our poles with steel strap by means of an ordinary strapping tool such as used by shipping departments for binding heavy crates. We have adopted a galvanized steel strap 1¼ inches wide with a tensile strength of approximately 5,000 pounds. This steel strapping is drawn tight around the pole and stub with a special tool and a seal is placed on the overlapping ends with a sealing tool.

When we first considered using this method of pole stubbing it was thought that a figure eight wrap, plus a full wrap of the steel strap around the pole and stub, would give greatest strength for strains in line with the pole lead and at right angles to the lead. However, tests indicated that the strapping broke under less strain with the figure eight wrap than with a single wrap around the pole and stub.

Various methods were tried but we finally decided that the most simple way was also the best. Our tests indicated that the strapping broke under a strain of between 5,000 and 6,000 pounds per strap or 10,000 to 12,000 pounds per band. One would naturally assume that the seal would be the weakest point in the band but this did not prove a fact, for in all of our tests not a single band broke at the seal. The breaks invariably occurred on the section between the pole and stub.

Essentially the same methods are used in pole stubbing with the steel straps as with conventional wire wraps or special clamps. The stub is placed next to the pole, transversely with the lead, one band is placed near the top of the stub and one near the ground

XUM

line. It is true that a strain in line with the lead will pull the pole out of line with the stub, but in our tests we have learned that the strapping will permit the pole to lean but a short distance under a side strain.

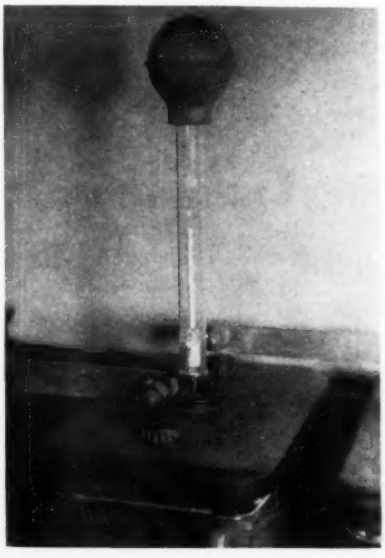
A line, properly guyed, will not permit unequal strains in line with the lead. For this reason the strap-stubbed pole proves entirely satisfactory and safe. It is true that one cannot tighten the steel strap band once it is clamped and sealed. This is not a serious problem as seldom, if ever, are stub bolts tightened once a bolted band is placed. If for any reason it is desirable to tighten the strapping, it is a simple matter to install a new strap and remove the old from around the pole and stub.

The strapping ordinarily used for box and crate binding will soon rust if used out on the line for pole stubbing. However, the same type of steel strap can be obtained galvanized at a small increase in cost. We have been using this type of steel strap for months and have not as yet detected any signs of rust."

The Vent Plug Type Hydrometer

The maintenance of the sealed glass-jar storage battery now in common use, is much easier than of the old-style open-type glass jar batteries formerly used in telephone exchanges. This maintenance may be further simplified by the use of a special hydrometer which is mounted in the vent plug of the pilot cell.

The rubber bulb of this hydrometer has a small hole in one side which is covered by the thumb as the bulb is depressed and then allowed to expand, which draws electrolyte up into the tube to float the hydrometer. After the reading is taken, the thumb is removed from the bulb hole and the electrolyte drains back into the cell with absolutely no waste.



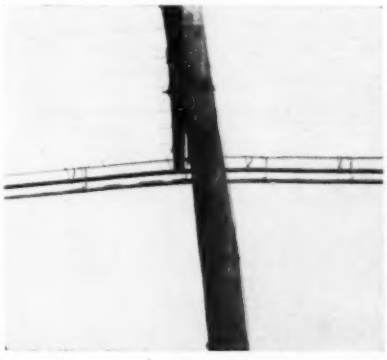
Use of vent plug type hydrometer on storage battery cell.

An ordinary portable hydrometer may be used for the infrequent reading of the other cells of the battery without difficulty but the necessary frequent reading of the pilot cell, if only a drop is lost each time, may result in a considerable lowering of its specific gravity in only a few months.

The use of a vent plug thermometer in one of the other cells is also recommended; the temperature of all cells will almost invariably be practically the same. The use of the vent plug type hydrometer should prove desirable in any telephone exchange.

Long Cable Rings Support Extra Cable

Occasionally it may become necessary to provide an increase in cable facilities on certain aerial cable leads in an exchange. It is, of course, possible to place rings, install a new and larger cable and, after cutting it into service, remove the older cable. This, however, costs money and requires considerable time.



Use of long cable rings to support second cable when additional facilities are needed.

Often a better plan is to make use of longer rings, placed on the messenger between the regular ones, to support a second cable directly beneath the old one.

This not only provides a reasonable increase in capacity but also avoids the loss of the existing cable and reduces considerably the cost of cable splicing. Special long cable rings may be obtained at reasonable cost, and this type of construction never presents unusual difficulties.

Using Chain Hoists in Construction Work

The chain hoist is a most useful telephone construction tool and can often be used to advantage in lieu of a block and tackle. One type of hoist, rated at 1½ tons' capacity, weighs only about 20 pounds. The chain is of a special type which will not tangle or bind. A lever is generally used to apply the power and the leverage is about 32 to 1; a 43-pound pull on the lever will lift about ¾ths of a ton on the chain.

The chain hoist is especially desirable for use in pulling guys, messenger strand, heavy wire or any work of similar nature where a block and tackle would ordinarily be used. The modern chain hoist is extremely simple to operate and may be used at all angles and at all rated loads with perfect safety. The worm-gear mechanism holds securely without the aid of dogs or springs.

The load on the hoist may be held at any point without the slightest danger of slipping, which is so common when a block and falls with a tied or snubbed fall line is used.

The various uses for chain hoists should be investigated by all progressive telephone companies not already using them.

Some Telephone Things I Didn't Know Until Now

By Oscar Will Tell

That cut-off jacks are again being used to replace the cut-off relay in some of the large multiple switchboards.

That a direct-reading direct-resistance ground tester is now available at a reasonable cost. It is convenient to use to make sure that ground connections are good.

That a power type masonry saw is now available which can be used in the accurate cutting of clay conduit of the multiple type.

XUM

Defense Efforts Endorsed

by South Carolina Companies

COOPERATION in every way with National Defense Program was discussed at annual convention of South Carolina association. Rural telephone service recognized as important part of industry and suggestions made for improvement

THE SAME cooperative spirit which unites the two political parties in the United States on the matter of preparedness, reaches the telephone industry and "we are ready to do our part," stated President F. S. Barnes, of Rock Hill, before the annual convention of the South Carolina Independent Telephone Association. The meeting was held November 11 and 12 at the new Wade Hampton Hotel in Columbia.

The association adopted a resolution pledging its aid to the National Defense Program in all respects in view of the fact that "Our government is engaged in a great program of preparedness—not for war, but for the defense of peace and the preservation of democracy in order that men may continue to be free, to engage in industry, to convene in association and in all ways to keep our nation great and free."

The officers of the association were all re-elected: President, Frank S. Barnes, Rock Hill; vice-president, L. E. Winget, Sumter; secretary, H. L. Draper, Sumter, and treasurer, T. C. Thomasson, Lancaster.

Re-elected to a three-year term as directors were Mr. Barnes and A. G. Trenholm of Georgetown. The term of J. W. Sprowles, of Greenwood, had expired and he declined re-election, so A. O. Bolen of Swansea was elected to succeed him. Mr. Sprowles had been a director for some time and the association passed a resolution expressing thanks to him for his service to the industry.

The other six directors are: C. B. Barksdale, Greenwood; S. A. George, Lexington; R. S. DuRant, Beaufort; S. L. Bell, Chester; L. E. Winget, Sumter, and T. C. Thomasson, Lancaster.

Telephone Companies and National Defense Program

Those attending the convention were fortunate in having convened in Columbia, for on the first day Colonel Frank Knox, Secretary of the Navy, spoke and 5,000 crack troops from the 40,000 stationed at Fort Jackson paraded in front of the State Capitol grounds where an 11-gun

TELE-SPOT

The new machine for locating faults on aerial telephone lines, without the necessity of climbing poles . . . also locates buried cable, water and gas pipes or wiring in the walls of buildings.

Equipment consists of: amplifying unit, exploring coil and line tapper, three 40 inch lengths of bakelite tubing, containing wiring to coil and communication lines for line tapper. Amplifier contains loud speaker.

Telephone men are displaying great interest in TELE-SPOT. May we send you additional information?

TELKOR, Inc., Elyria, Ohio

DAVEY TREE TRIMMING SERVICE

1846 1923

JOHN DAVEY
Founder of Tree Surgery

Winter Trimming

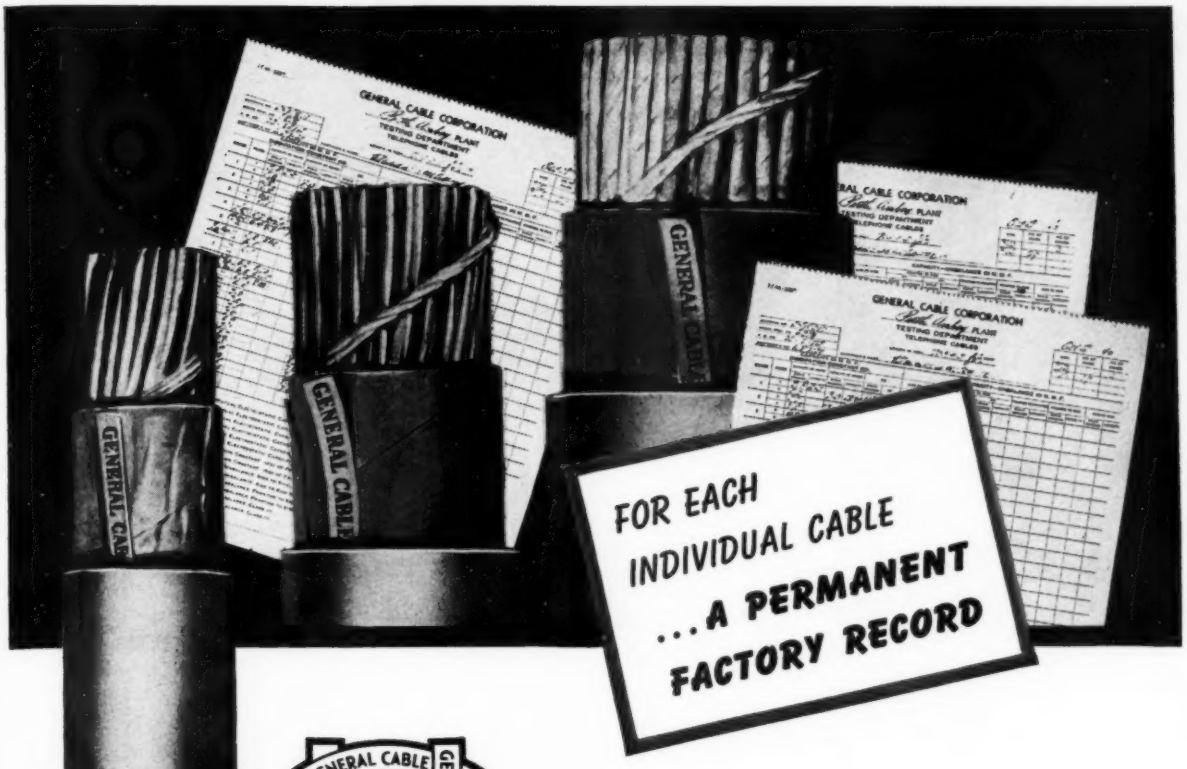
- *No Foliage*
- *Cheaper Brush Disposal*
- *Easier Trimming Permissions*
- *Better Working Vision*

Always use dependable Davey Service

DAVEY TREE EXPERT CO., Kent, Ohio

DAVEY TREE SERVICE

XUM



PAPER TELEPHONE CABLES

The individual test records on each length of Paper Telephone Cable manufactured by General Cable certify the exact history of its making and factory testing. Telephone cables are a very specialized product, in which the component materials and manufacturing technique greatly affect life and serviceability. General Cable's experience in the manufacture of Paper Telephone Cables is registered and reflected in permanent factory test records.

DISTRIBUTED BY

AMERICAN AUTOMATIC ELECTRIC SALES COMPANY

1033 W. Van Buren St., Chicago, Illinois—Warehouses in Dallas, Tex.—Kansas City, Mo.—Richmond, Va.—San Francisco, Cal.

XUM

F. A. BARNES of Rock Hill was re-elected president of the South Carolina Independent Telephone Association. Mr. Barnes is also a director of the United States Independent Telephone Association.

salute was fired as army airplanes roared overhead. After the parade the manufacturers' exhibits were visited where the latest in telephone materials and equipment were shown.

President F. S. Barnes, of Rock Hill made the opening address at the first afternoon session — welcoming all to the convention. Mr. Barnes said he was sure everyone had been impressed with the parade of preparedness climaxed by the speech of Secretary of the Navy Knox, when he stated that we were two parties united on the same program of preparedness. This same cooperative spirit reaches the telephone industry and we are ready to do our part.

He reviewed the association's activities and the bills affecting the telephone industry introduced during the year in the state legislature, giving their present status. Mr. Barnes urged that companies having any unusual problems on account of the government placing camps or because of other army activities, advise the association in order that they may obtain help through taking advantage of the experience of others.

President Barnes concluded his address with the statement that the coming year doubtless will be a very busy one, presenting many new problems to the industry, and that telephone people must work all the harder keeping up with the changes.

Secretary H. L. Draper, of Sumter reported that the association now has a paid membership of 24 of the 53 companies in the state. This is four more than last year. During the year a new company was organized — St. Matthews Telephone Co. operated by Mrs. C. B. Stack. The secretary stated the association welcomed Mrs. Stack and was glad to see her start in the business in the right way by joining the association.

Treasurer T. C. Thomasson of Lancaster reported that the finances of the association are in excellent condition.

Louis Pitcher, of Chicago, Ill., executive vice-president of the United States Independent Telephone Association, spoke of the preparedness program of our nation. The national association has appointed a defense committee which is working with the Army and Navy Departments. Mr. Pitcher said the association had been assured that the War Department does not want to take over the telephone industry; that it feels most efficient service can be rendered by the companies operated by telephone men cooperating with the Army and Navy.

He urged that the national association be advised immediately if any problems arise in connection with Army telephone facilities. He also urged that telephone men taken into the service by draft or enlistment should notify the national association in order that it might get them placed in the Signal Corps where they could do the most good. The association's defense committee is working to have enlisted men transferred from areas having their quota in Signal Corps to those areas that do not have their quotas.

L. E. WINGET of Sumter, re-elected vice-president of the South Carolina association, presided at the traffic conference during recent convention.

Just Compare the Cost— and Genuine IRONITE Wins

Start your comparison with the first cost (can you match the prices quoted below)—and continue with lower installation cost, due to ease of working—then on to long life with no trouble calls—and Genuine IRONITE Drop Wire proves its economy at every point. The long life is built into the strength of the conductors, the weather-resistance of the 30% rubber insulation and mica-armored braid.

Order a coil today and make IRONITE itself show you the savings you will find in its regular and continued use. It really pays to replace old drop wires with Genuine IRONITE.

NET PRICES — From Your Jobber or From Us — Plus Freight

	TWISTED PAIR		PARALLEL PAIR	
	19 BWG 17 B&S	18 BWG 16 B&S	19 BWG 17 B&S	18 BWG 16 B&S
Less than 1,000 feet	$12.60	$13.60	$11.00	$12.90
1,000 to 5,000 feet	11.20	12.09	9.77	11.47
5,000 to 10,000 feet	10.50	11.34	9.16	10.75
10,000 to 25,000 feet	9.88	10.67	8.62	10.12
25,000 feet and over	9.55	10.31	8.33	9.77

PARAGON ELECTRIC CO., 39 W. Van Buren Street, CHICAGO, ILLINOIS

XUM

H. L. DRAPER of Sumter, re-elected secretary of the South Carolina association, reported a good increase in the organization's membership during the year.

Mr. Pitcher reviewed the results of the Blakeslee report on toll compensation and its benefit to the connecting companies; he advised that copies of the condensed report are still available to member companies requesting them. Inflation and high prices, said Mr. Pitcher, work unusual hardship on telephone companies, for unlike the average business, they cannot raise their rates overnight; increases in rates must go through channels which take much time and all the while the companies are paying increased prices for materials and supplies.

He told of the appointment of Clyde S. Bailey as the Washington representative of the United States Independent Telephone Association. Mr. Pitcher said he was sure the association members would be interested to know that A. L. Geiger, former Washington representative, is now living in Tampa, Fla., where he is engaged in private law practice.

Rural Service and Small Exchanges

At the plant conference which followed the general session, S. L. Bell of the Chester Telephone Co., gave a brief history of rural telephone service from its early use to date.

The needs for rural telephone service were then covered from the standpoint of the rural subscriber—then from the viewpoint of the company. It was emphasized that rural extensions must be made on a sound economical basis after a careful study of each line to be served. It was also pointed out that rural service increased the value of exchange service.

H. W. Askins, owner of the Chesnee Telephone Co., then spoke on the small exchange service where one man is usually general manager, collector, construction foreman and troubleman. He emphasized the need for having rules and sticking by them, serving all alike, to improve public relations.

Mr. Askins stressed the importance of preventive maintenance on the switchboard, outside plant, and instruments to avoid major repairs. "Instruct the operator to catch trouble before it is reported by the subscriber," he recommended.

L. E. Winget, general manager of the South Carolina Continental Telephone Co., Sumter, presided at the traffic conference which likewise followed the first general session.

Mr. Winget explained the origin of the word "subscriber" as used in the telephone business and the origin of the expression "peg count." He then introduced Miss Carrie Mae Jones, chief operator at the Florence exchange, who briefly outlined the selection and training of new operators.

Each chief operator present brought up her problems and they were discussed as to the proper method of handling. It was significant that many of the operators experienced the same situations, even though they were in exchanges in different parts of the state.

The annual banquet was held the evening of the first day of the convention. Dr. D. W. Daniel, dean of English, Clemson College, delivered the main address. Dr. Daniel suggested that hope, courage and courtesy be called on for building better business. He stressed the value of courtesy which, he said, "results in good will; and good will is good business."

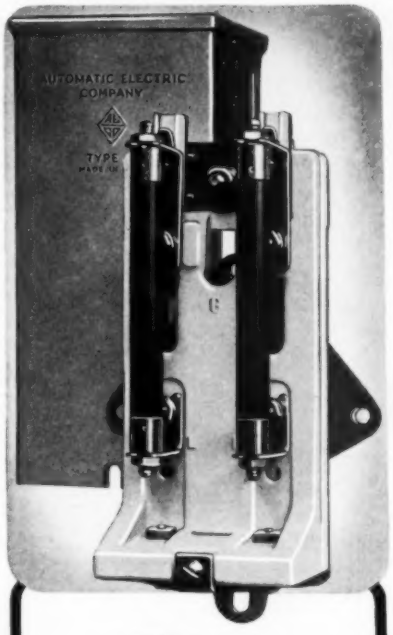
Music and entertainment was furnished by the "Columbia College Sextette."

The session of the second day was devoted to a discussion of rural development. Thomas Crouch, district manager, Columbia, S. C. and Pete Fleming of the Charlotte district of the Southern Bell Telephone & Telegraph Co., gave an outline of what they are doing in an effort to expand rural service to all areas of the company's territory in the state.

The reports of the resolutions and nominating committees were received and adopted as previously mentioned.

SANDS

SUBSTATION PROTECTOR



TYPE 15

for Indoors or Outdoors

Here is a new weather-proof design which provides better protection at lower cost on any type of line. It saves installation cost because its new "Four Point" bracket makes mounting easier. It pares maintenance expense, thanks to the Type 2105 discharge block, which resets itself after operation.

Next time, order Type 15; it assures you complete protection.

AUTOMATIC ELECTRIC

AE GP

TELEPHONE, SIGNALING, AND COMMUNICATION APPARATUS

Distributors in U. S. and Possessions:
AMERICAN AUTOMATIC ELECTRIC SALES COMPANY
1033 West Van Buren Street, Chicago, U.S.A.

with CHANCE construction materials

1. Chance Guy Fixtures make dependable, easily applied guy attachments. The Chance Thimbleye on all Chance fixtures gives extra protection to guy strand and aids slack pulling.
2. There's a Chance anchor for every job. Steel expanding, Wej-Lock malleable expanding, Never Creep malleable plates, Cone, Rock, and Screw anchors of all types. A complete range of sizes.
3. Chance Anchor Rods give you 1, 2, or 3 strand attachments. Thimbleye, Twineye, or Tripleye—threaded or Never Creep.
4. Chance Cable Rings are No-tangle packed. They hold without slipping or jumping off due to spiral gripping hook and shoulder hook. Smooth curved surface minimizes cutting.
5. Chance Pulley Blocks are light in weight and powerful in pull. No burden to carry on the job. Easy to operate.
6. Chance Reversible Point Pike Pole prevents dangerous projections on the truck. Point is freed by button release. Points are renewable at little cost. Spiral point holds tight to the pole.

Consult your Chance catalog for complete information about Chance construction tools.

A·B·CHANCE CO. CENTRALIA MISSOURI

J. A. Smith Passes Away

JESSE ANDERSON SMITH, age 64, Chicago, Ill., publisher of Telephone Engineer, passed away at the Evanston (Ill.) Hospital Wednesday morning, November 20. He had undergone an operation two weeks ago, but the immediate cause of death was coronary thrombosis.

Mr. Smith was born in Bright Star, Ark., October 22, 1876. His boyhood was spent on a farm and his early education was in the country schools. At the age of 16 he went to Atlanta, the seat of Cass County, Texas, to work on a newspaper of which his brother, Aaron, was editor. From there he went to Weatherford, Texas, on another newspaper and from 1901 to 1903 was with the McKinney (Texas) Gazette.

Then he became associated with his brother, Aaron, in a printing business in Fort Worth, Texas. In 1905 they founded The Transmitter there to represent the Independent telephone interests in the Southwest. From 1907 to 1910 Mr. Smith was engaged in newspaper work in Chandler and Vinita, Okla.

In the latter year he again joined with The Transmitter as business manager, and later became its publisher. In 1927 he purchased Telephone Engineer and moved to Chicago. The Transmitter was published for the next four years by his son, Ray. It was consolidated with Telephone Engineer in 1931.

Mr. Smith was well known to Texas telephone men and had formed a wide acquaintance with telephone men in other sections of the country since his connection with Telephone Engineer of which he was president and treasurer.

He had always been active in the Methodist Church and at the time of his death was chairman of the board of trustees and head of the finance committee of the Wesley Memorial Methodist Church in Chicago. He was a member of the Masonic order and also of the Independent Pioneer Telephone Association, being on its executive committee.

The sudden death November 20 of J. A. SMITH, publisher of Telephone Engineer, Chicago, Ill., will sadden his many friends throughout the telephone industry.

Mr. Smith was held in high regard by everyone who knew him and respected his sound judgment and advice. His kindly and friendly disposition won him many friends who will be saddened by his death.

Funeral services were held at the Hebblethwaite Funeral Home, Evanston, on Friday morning, November 22. He is survived by his widow, Myrta L.; two sons, Roy and Ray, both associated with Telephone Engineer; two step-daughters, Mrs. E. A. Reach and Ina B. Heiple, and one step-son, Fred Heiple.

To Spend $63,000 for Airplane Plant Facilities

A new construction program for Columbus contemplating the expenditure of more than $112,000 has just been announced by the Ohio Bell Telephone Co. The principal item in the project calls for construction and installations of various kinds to handle the anticipated needs of the proposed $10,000,000 airplane plant of the Curtis-Wright Corp. to be built at Port Columbus.

This work, it is estimated, will cost $63,000; it will include the placing of 2,000 feet of overhead cable, 11,800 trench feet of conduit, more than 15,000 feet of underground cable, and the removal of more than 18,000 feet of overhead cable. This project has already been started and will be completed in time to furnish the telephone facilities to the new airplane plant.

The balance of the program will consist of additions to expand inter-exchange facilities, and expansion of the company's plant in an exchange area where increased demand has made more equipment necessary.

Station Installations on Rural Lines

(Continued from page 20)

or other metal objects if such location can possibly be avoided. When a subscriber selects a location for a telephone in a closet or other out-of-the-way spot he should be advised that difficulty in hearing the bells from some parts of the house will probably be experienced.

The bells of the telephone set, when a desk type instrument is used, should always be mounted horizontal. If the bells or gongs are mounted so that one is above the other, their efficiency will be greatly reduced on most instruments. When the dry cell battery cannot be inclosed in the telephone, a suitable battery box should be used and securely mounted nearby.

The telephone set should always be securely mounted on the wall in a manner that it will never come loose. On plaster walls care should be taken that all screws are located in lath. When metal lath is used, a backboard fastened with toggle bolts will probably be required. Even the protector will probably require a backboard on this type of wall.

The house wire is generally of No. 19 gauge although No. 22 gauge is now used to some extent. Marked improvement has been made during the past few years in the development and improvement of this type of wire. The newer wire with the non-braid type insulation is much smaller than the conventional type. It may be obtained in rich ivory or silver gray tint to match light-colored walls, or rich brown for runs on dark woodwork.

Wire runs from the protector to the telephone should be made as neat and direct as possible. Concealed wiring may be used to advantage although it generally proves expensive, unless necessary conduits have been placed during the construction of the house.

Wiring for the average rural telephone instrument is merely tacked around base boards with milonite nails. An installation of this type may be made neat if care is exercised to pull the wire tight and form it properly in corners and on turns.

Inside wire should not be run on plaster walls when it can possibly be avoided. When such runs must be used, the wire can generally be supported best by the use of small cleats attached with screws which are anchored in the lath, or by the use of long milonite nails. Inside wire should, in general, not be spliced but short lengths should be retained and used where they will fit a particular need.

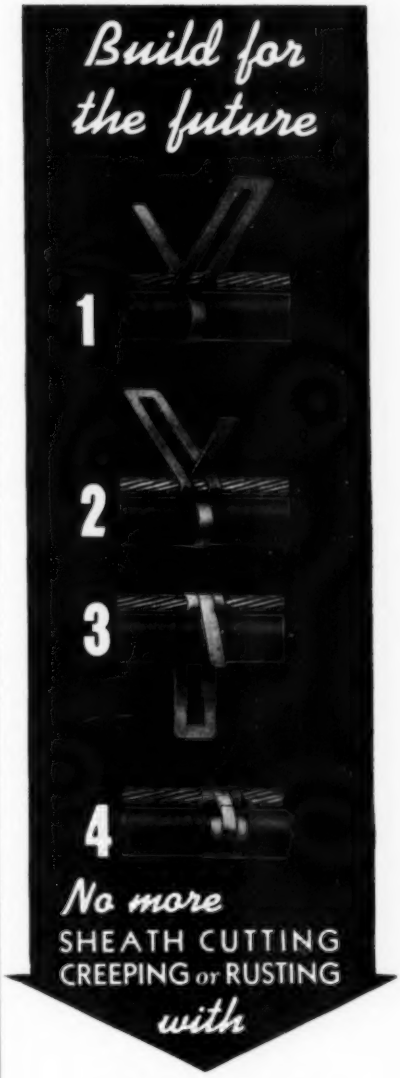
When inside wire must be spliced the use of compression type sleeves are recommended. When it is necessary to make a bridge splice on inside wire so as to connect an extension telephone, the use of a suitable connecting block is generally desirable. When an underground service is used and the protector is installed out on the line, then a similar connecting block may be used to connect the buried wire or cable to the house wire. House wire is two-conductor for straight-line ringing and three-conductor for party-line service.

Installers should always have available screws of a proper size and length. A short screw will be required for mounting a connecting block, protector or telephone on wood and one of greater length for plaster as it must extend through the plaster and anchor firmly in the lathe. Likewise, a short milonite tack is needed for fastening house wire on a base board; but if the same wire must be attached to plaster, a much longer nail is necessary.

Toggle bolts are required for the mounting of backboards on steel lath, plaster or hollow tile walls. An adequate supply of both rubber and friction tape should be available and used to protect house wire where it extends through walls and floors. This protection is especially necessary when wiring is run through floors which are frequently mopped with water. A short length of flexible loom, taped in place, may be used for this purpose where not prohibited by appearances.

Care should be exercised in the connection of wires to binding posts of apparatus. The insulation should be removed for a proper distance and the conductors cleaned well. The wires should be wrapped around binding posts in the direction the nut tightens. Wires should be separated by washers for if two are placed around the binding post together, one may cross the other and be cut by the pressure placed on them when the nut is tightened.

Wire should be formed neatly around the base of connecting blocks and protectors but no spiral turns or unsightly slack loops should be permitted. Neither should excessive slack be left in wire in a telephone, as it may foul the ringer movement and cause trouble.



RELIABLE
DAVIDSON CABLE HANGERS

Read this user's verification of Davidson Cable Hanger merits. "Cable does not creep on steepest grade and as for looks, no job with other type of hangers can compete with Davidson hanger job. Protection from lightning is much more efficient." Let us tell you how Davidson Hangers will materially reduce maintenance costs of your aerial cable plant.

Complete information will be sent on request.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

XUM

GRAY
TELEPHONE PAY STATIONS

23J Compact Hand Set Type

offer

Opportunities

To even the smallest telephone company to increase revenues.

Check your likely locations today.

New literature is available.

Contact one of our agents as listed below.

AUTHORIZED AGENTS:

American Automatic Electric Sales Co.
Graybar Electric Company
Kellogg Switchboard & Supply Company
Leich Sales Corporation
The North Electric Mfg. Company
Stromberg-Carlson Telephone Manufacturing Company

IN CANADA:

Canadian Telephones & Supplies, Limited
Northern Electric Co., Limited

THE GRAY MANUFACTURING CO.

When a clamp is used for a ground connection it should be placed in a location on a pipe less subject to injury by plumbers. The pipe where the connection is made should be well cleaned by scraping and then polished with sand paper or emery cloth.

While this article does not advocate any radical change in the installation of telephones it does attempt to indicate how the latest developments in material may be used to advantage. An attempt has been made to indicate how approved installation methods should be observed.

It will be noted that the use of soldered connections are not advocated. This bothersome job has been eliminated by the use of compression type sleeves, solderless connectors and ground clamps. The use of material and methods as herein indicated should do much to insure long and trouble-free service on any telephone line.

Coaxial Cable System Used in Storm Emergency

From November 11 to 13, an early winter storm of unusual severity, marked by tornadoes, blizzards, and near-zero temperatures, swept across the country from the Rocky Mountains to the Appalachians, doing heavy damage to property over a wide area. In some sections open wire telephone lines were hard hit. In the upper Mississippi Valley the Madison-La Crosse-Hastings and Davenport-Minneapolis routes suffered numerous wire breaks.

In this emergency the new type L carrier system, on which installation and testing is in progress between Minneapolis, Minn., and Stevens Point, Wis., was rushed into service, despite the fact that regular commercial service is not scheduled to begin until the middle of next year. Fifteen Chicago-Minneapolis circuits were routed over the coaxial system between November 11 and November 15. All of the emergency circuits were restored to normal routings as soon as the storm damage was repaired.

G. R. McKelvey General Manager of Alabama Company

G. R. McKelvey, manager of the Dothan (Ala.) district of the Standard Telephone & Telegraph Co. and active in Alabama association affairs, has been appointed general manager of the company, according to a November 16 announcement of President Lane Enzor, of Troy.

The best wishes of his many friends in the Independent industry will be with G. R. McKELVEY, of Dothan, Ala., as he assumes his new duties as general manager of the Standard Telephone & Telegraph Co.

Mr. McKelvey has been district manager for the Dothan area for the past three years. He will now take over the supervision of the company's entire operations, Mr. Enzor stated.

President of the Alabama Independent Telephone Association during the past year, Mr. McKelvey has taken an active interest in the welfare and progress of the Independent industry. He is now a director of the state association.

The Standard company operates in ten southeastern Alabama counties, and serves a number of towns, of which the largest are Andalusia and Dothan. Although his new duties cover the entire territory of the company, Mr. McKelvey will continue to reside in Dothan.

A. T. & T. Has Larger Nine Months' Income

The net operating income of the American Telephone & Telegraph Co. for the first nine months of 1940 was $12,896,623, compared with $12,534,005 for the corresponding period of 1939, the company reports.

For the month of September the company reported net operating income of $483,734. This compares with a net operating income of $2,409,127 in September, 1939.

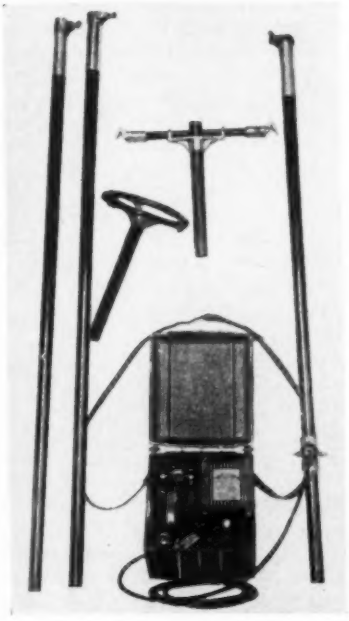
The net income of the company, which includes dividends received from subsidiary and other companies, totaled for the first nine months of the year $135,361,559, an increase of $10,325,663 over the corresponding period of 1939.

XUM

Vacuum Tube Tester Locates Line Faults

THE "TELE-SPOT," a vacuum tube test instrument which is said to quickly and accurately locate faults on aerial telephone or telegraph lines, has just been developed by Telkor, Inc., Elyria, Ohio.

The new device, it is stated, will not only locate aerial line faults to within a few inches without the necessity of climbing poles or leaving the ground, but will also determine the location of buried cable or of gas and water pipes.



The Tele-Spot, a new test instrument which locates aerial line faults. Shown are the amplifier, three pole sections, exploring coil and wire tapper.

It can trace the course of a pipe or cable with great accuracy and can also locate wiring concealed in building walls.

The heart of the Tele-Spot is the amplifying unit, which uses three vacuum tubes, including a power tube. The amplifier output is connected to a three-inch loudspeaker mounted in the case; connections are provided so that a headset may be used if desired. The amplifier is mounted in a crackle-finish cast aluminum cabinet and can easily be carried by means of a shoulder strap. The complete amplifier weighs about 10½ pounds.

An "exploring coil" and pole are used to pick up, by radiation, a tone which is impressed on the line for testing. The coil is of the air-core type, and is mounted on a 12-inch length of ⅛-inch bakelite tubing, which can be plugged into the top of the pole.

The pole consists of three sections of tubing, each 40 inches long. All three sections may be used when searching for a fault; when locating underground cable or pipe it is usually necessary to employ only one or two sections of the pole. The lower section has a receptacle, into which is plugged a cord leading to the amplifier input.

In operation, a tone is placed on the telephone line and the troubleman then picks up this signal by means of the exploring coil, amplifier and loud speaker, as he walks along under the line, or drives along an adjacent road. If at some point along the line no tone is heard, the location of the fault has been passed. By checking back to a point where the tone is again heard, the fault may be located accurately.

The amplifier unit of the Tele-Spot. It uses three vacuum tubes, including a power tube.

If, having located the trouble, the tester wishes to call back to the home office, he removes the exploring coil and in its place plugs in the line tapper, which is also mounted on a short

Reduce Costs OF TEMPORARY INSTALLATIONS WITH KEARNEY NO-RENCH SCREW ANCHORS

Provides inexpensive guying of bracket or single phase ridge pin lines.

TIME and again temporary guying is demanded. Immediately, the operating man must think in terms of cost and time. Kearney No-Rench screw anchors, made of Certified Specification Malleable Iron, are 100% salvageable, because the rod and helix are one unit and may be screwed in or out of the ground conveniently.

They are efficient for permanent guying, too, having holding powers from 2,000 lbs. to 13,000 lbs., depending on the anchor size. Ideal for permanent anchorage where lawns or flowerbeds prohibit hole-digging.

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO. The Mark of Quality Products

TELEPHONE ACCESSORIES for BETTER LINE CONSTRUCTION and MAINTENANCE

XUM

length of bakelite tubing. He then places the tapper over the line, plugs in his transmitter to connections provided on the amplifier case, and is ready to talk.

In locating underground cable, water pipes, or gas pipes, a different condition exists; the tone is heard on either side of the cable or pipe rather than, as might be expected, directly above. For example, if the tone is picked up at two points 12 feet apart, then the cable is located directly below the midpoint of a line connecting the two tone points, and at a depth equal to the distance from the midpoint to one of the tone pickup points; that is, six feet from one of the tone points, and six feet below the surface.

Although almost any tone generator set can be used in connection with the Tele-Spot amplifier, the best tone reception will be obtained with a 400-cycle generator, since the amplifier is tuned to that frequency. No tone generator is furnished with the Tele-Spot —most companies will already have one—but a special battery-operated portable one is available. This is thus entirely independent of any power line for its operation. It uses a 400-cycle tuning fork, and by means of a clock mechanism can be made to give 120 tone impulses per minute. It is powered by three No. 6 dry cells.

The tone may be impressed on an aerial line at any convenient point; it may be connected to a cable sheath at a manhole, or to a water or gas pipe at any point where the pipe is above ground, such as at a faucet. When locating wiring which is concealed in a building wall, the tone may be put on the line at a point where the wiring enters the building.

The Tele-Spot will fill a long-felt need, the manufacturer believes, for a means of quickly and accurately locating line faults. The instrument should be valuable, not only to telephone companies, but also to telegraph companies, power companies, electrical contractors and municipalities. Excavating contractors, it is pointed out, will find the Tele-Spot of value in locating hidden pipe lines, to avoid damage to them by the excavating equipment.

BOOK REVIEW

TELEPHONE SELLING, edited by Norris A. Brisco; 351 pages, 9 ins. by 6 ins.; many illustrations; published by Prentice-Hall, Inc., New York; price $3.75.

Selling by telephone is becoming more and more important today to progressive retailers who wish to "stay ahead of the competition" and serve the increasing number of potential customers who live at a distance from their stores. This new book was compiled on the basis of a nationwide survey of telephone selling made by a group of specialists.

As explained in the preface, the book aims to present the fundamental principles of selling merchandise or service by telephone; to present actual problems that must be met by salespeople and executives in order successfully to sell merchandise by telephone, and to combine the textual discussions with concrete examples. That it has succeeded in these aims is evident from a perusal of its pages.

In its 26 chapters, "Telephone Selling" takes up many factors which must be considered and problems which must be solved if a telephone selling campaign is to be successful. Several chapters are devoted to telephone salesmanship—how the telephone sales personnel of a store can, through the exercise of courtesy and sales technique, sell extra merchandise on telephone order calls; how it can make sales even on inquiry calls, and how it can retain and build customer goodwill.

Other chapters deal with telephone sales procedure. Here such subjects as maintaining high standards of service, planning telephone sales procedure and handling telephone orders are discussed in detail. The selection and training of telephone sales personnel are taken up in other sections of the book; and separate chapters discuss other telephone sales topics, including public relations selling, telephone solicitation, and other related subjects.

Throughout the book, reproductions of advertisements showing how stores have handled typical problems of telephone selling campaigns add much to the interest and clarity of the text. The latter includes many actual examples of telephone sales conversations and descriptions of actual cases where stores have met and solved telephone sales problems.

The appendix includes reproductions of typical forms and tables used by telephone salespersons, and a summary of a survey of the "extra business" obtained by using correct telephone sales technique.

"Telephone Selling" is a book which will be valuable for store executives who wish to inaugurate or improve telephone sales work, and for commercial departments of telephone companies and managers for suggestions in stimulating the use of the telephone by stores and other retailers.

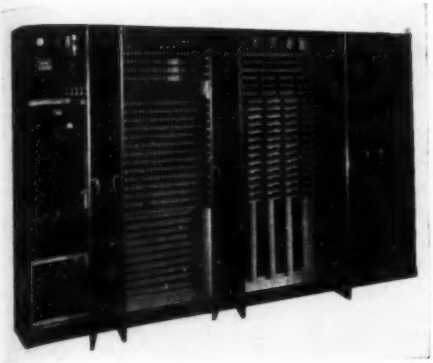
To Insure Profit-making Lines— Use

AMCRECO
FULL LENGTH
Pressure Treated
POLES

Send for this valuable Handbook. It contains a wealth of data on poles.
Free to executives and engineers.

AMERICAN CREOSOTING COMPANY
INCORPORATED
COLONIAL CREOSOTING COMPANY INCORPORATED
AMCRECO LOWRY PROCESS CREOSOTED WOOD
GEORGIA CREOSOTING COMPANY INCORPORATED
ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.

BELOW: Kellogg 100-line Relaymatic which was also demonstrated at convention.



and magneto telephones were connected to the Masterbuilt Junior and from them hundreds of calls were placed through the switchboard which were routed in turn through the Relaymatic and then on to lines leading to dial telephones.

BELOW: The Kellogg Masterbuilt Junior and the Kellogg type "K" PBX, shown in this view of one of the Kellogg exhibit rooms, were in operation throughout the recent national convention.

Demonstration Proves Interesting to Telephone Men

Of interest to most telephone men who attended the recent 44th annual telephone convention in Chicago was the demonstration of the Kellogg Relaymatic, the Kellogg Masterbuilt Junior and the versatile type "K" PBX.

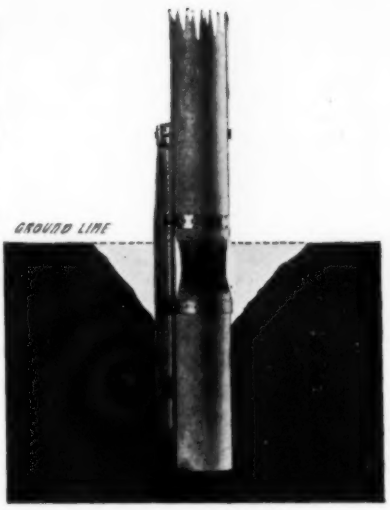
These switchboards were in actual operation. They were all connected together to show the operating characteristics of each, and to demonstrate the flexibility of the equipment.

In one instance, the operating man operated the board in connection with the Masterbuilt Junior as a typical common battery manual main exchange, and in the next moment he operated it in connection with a Relaymatic main exchange—without alteration of either the circuits or the apparatus. Both common battery manual

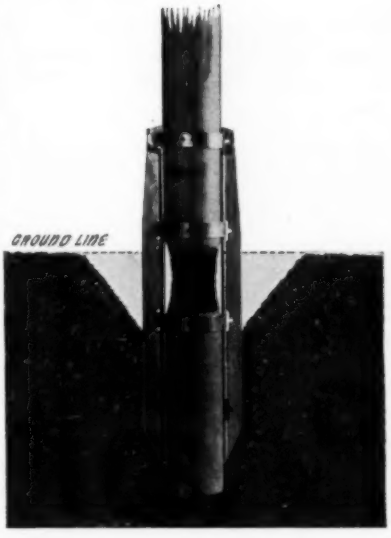
Because the Relaymatic, Masterbuilt Junior and type "K" PBX were connected together just as they would be in the field under actual operating conditions, anyone could make calls which would tie all three switchboards into one continuous connection.

The Relaymatic consisted of four bays occupying a floor space of 12 feet by 1½ feet. Its equipment was conveniently arranged so as to allow for easy inspection of every part. Thus, all visitors were able to trace each call as it was handled by the board in setting up the connections. The speed and accuracy with which the Relaymatic handled the establishing of connections typified the efficiency of this kind of equipment.

As a whole, this demonstration of Kellogg equipment was both educational and entertaining.



VAN POLE SUPPORTS
FOR REPAIRING POLES 8" TO 14" DIAMETER ROTTED AT THE GROUND LINE.



VAN POLE SUPPORTS
FOR REPAIRING POLES ABOVE 14" DIAMETER ROTTED AT THE GROUND LINE.

"VAN" POLE SUPPORTS
VANDERVEER & WALKER
ERIE, PA.

XUM

Switchboard Replacement and Conversion Problems

(Continued from page 28)

be no first cost for telephones in the initial period. There would, however, be the complete replacement of the existing telephones under the conversion plan. It is true that the present telephones might be equipped with dial so that it would not be necessary to purchase all new telephone sets.

If, however, a magneto system is to be converted to either a common battery or a dial, only the difference in cost of the two types of telephone sets would be included in the comparative cost estimate. If new dial telephones are to be provided, the dial system must be charged with the cost of the new telephones installed, less the salvage value of the retired telephones.

In the five-year-up forecast of first cost of the two systems under comparison, the difference in cost of the two types of telephones should be included in the study.

(4) OTHER PLANT COSTS: Any costs for plant which are not the same for the two systems should be included in the first cost estimates. This item should include cut-in and telephone company labor, and material required in the installation and cut-over of the two systems being compared.

All outside plant costs for cable, pole lines and circuits that are not the same for the two systems should be included. In order to simplify the cost comparison it is generally satisfactory to show the difference in cost as chargeable to the system for which the increase in cost applies.

The first cost of all items entering into the study should be summarized to obtain the first cost of the new plant installed exclusive of overheads.

To the first cost should be added, first, telephone company's engineering and engineering expense. This will include commercial, plant, traffic and equipment engineering. This will give the total direct construction cost.

To this construction cost should be added the overheads to cover: general executive, auditing and other administrative costs (if such costs are incurred); taxes, if any, during construction; fire insurance during construction, casualty insurance during construction on telephone company labor. This will give the total construction cost exclusive of interest during construction. To this cost should be added interest during construction to obtain the grand total all construction cost.

We have now theoretically engineered, installed and cut into service two types of systems—a replacement and a conversion. The next problem is to determine the carrying charges on the two types of plant, and the operating cost applicable to the two systems.

The annual charges will vary for the different types of plant somewhat as follows:

(1) ON LAND AND BUILDINGS, the difference in the taxes on the land, if the land values are different for the two types of systems; on building, the annual charges should include interest, depreciation, taxes and insurance, and repairs that are not chargeable to depreciation. If the equipment is housed in rented quarters, then the rent and other building expenses should be charged for each system, if there is a difference in the amounts chargeable.

(2) CENTRAL OFFICE EQUIPMENT: The annual charges on the central office equipment should include interest, taxes, depreciation, and may include maintenance. Generally, however, it is the preferred practice to consider the item of maintenance as a separate item.

(3) TELEPHONES: The annual charges on the telephones should include interest, depreciation, taxes, if any. Maintenance, if there is a difference for the two systems, should be covered in a separate item.

(4) OTHER PLANT COSTS: The annual charges on the plant costs involved should include, therefore, underground conduit, underground and aerial cable, pole lines and wire plant, which are, interest, taxes, depreciation and maintenance. The items of depreciation, taxes and maintenance will, of course, be different for each of these classes of outside plant.

After the annual charges have been determined for all the items of first cost, the operating costs should be figured for each of the systems under comparison. The operating costs should include:

The 85-Year-Old Secret...

THAT CUTS TELEPHONE OPERATING TAXES TODAY

WELCOME indeed is *any* tax-relief from your operating budget. Thrice welcome this relief when you're assured, through Hemingrays, that the tax-saving is permanent... "has lasted 50 years"— one prominent utility reports.

REASON lies in the 85-year-old secret Hemingray glass "batch-mix"— plus Owens-Illinois quality-controlled production. Result! Insulators free of voids, strains and stresses and so homogeneous that moisture can't penetrate them. Temperature changes leave them unimpaired—they outlive poles, hardware and crossarms.

COST IS LOW, supply constant, but only through principal jobbers.

The Rural "Toll" Line Favorite

... is Hemingray Number 42. Its long leakage path means trouble-free operation. Other rural headliners... Numbers 9 and 16. Ask for samples.

OWENS-ILLINOIS

HEMINGRAY Telephone & Telegraph Insulators · LOWEX Power Insulators

Export Agents: International Standard Electric Corp., New York

XUM

Traffic expense for each of the systems; namely, operators' salaries and other traffic expenses properly chargeable to each system.

Difference in the cost of commercial power required to operate the two systems.

Difference in the cost of central office maintenance of the two systems.

Difference in the cost of the maintenance of the different types of telephones, if there is a difference. This should include cost of dry batteries if we are considering the conversion of a magneto to either a common battery or dial system.

Any other expenses that will be incurred in connection with each of the systems being compared.

The annual charges and operating expenses may now be totaled for the initial period and for each year or period of years covered by the study. The total annual charges and operating expenses will show which of the two systems is the more economical to operate. With this information and a summary of the total first cost for each of the two systems the management has reliable data on the basis of which a decision can be made as to whether the system should be replaced or converted to some other type.

There are, of course, many cases that are border-line cases; others in which the important question of policy must be considered. In other words, there are some intangible items which cannot be reduced to a cost basis. Generally, however, the comparative estimate provides sufficient data to show whether a replacement or conversion job should be undertaken.

Small Exchanges Can Be Made Dividend-Paying

(Continued from page 25)

many times over, the time and efforts you have given.

I want to impress upon you this fact: that it is our duty, as a part of this great communication system, to put forth every effort to maintain a service beyond criticism. We can only do this with new and modern equipment; and we can only have new and modern equipment when we have adequate rates to warrant this investment. With my exchange, it was my job; with your exchange, it is your job, and I know you can do it. You have a big advantage: you are experienced telephone men; I was just a green-horn.

In the past few years, operating costs in our industry have been gradually climbing. Material costs, taxes and the gradual decline in subscribers, are three of the main reasons. The average small company has not made an effort to offset these rising costs, its rates remaining the same. Profits of previous years have been wiped out and the present revenues are not sufficient to meet operating costs. Consequently, plant and equipment have been neglected.

Many have been of the opinion that they would have lost still more subscribers if a higher rate were asked. This would prove true unless you can supply your patrons with more efficient service. You now have the opportunity to give this more efficient service to your community.

Not long ago I read an article where the author made the statement that "Opportunity does not just happen, but is created by each individual." I question this writer's opinion. An opportunity has been created for us by the manufacturers of dial automatic for small communities. If we fail to grasp this opportunity, we have failed in our duty to our community and ourselves.

During these times of stress and uncertainty, it is imperative that each one of us build and maintain our exchange at a higher point of efficiency than ever before.

I believe thoroughly that trying for an increase in rates without installation of new and modern equipment would meet with disapproval and resistance in your community; but I am convinced, through my own experience, that if you will place your problem honestly and fairly before your subscribers and convey to them that it is your desire to give your community the best in telephone equipment and service, you will be agreeably surprised how little opposition you will encounter.

Nebraska Association Will Meet in Lincoln

The 1941 convention of the Nebraska Telephone Association will take place April 8 and 9, according to George M. Kloidy, of Lincoln, secretary-treasurer of the association. The meeting will be held at Lincoln, in the Hotel Lincoln.

Crapo
HIGH-TENSILE
LOW-RESISTANCE
TELEPHONE WIRE

Crapo HTL-85 — For Long Spans
Crapo HTL-135 — For Extra Long Spans

LOWER FIRST COSTS
LESS MAINTENANCE

Construction costs are reduced to a new low level, maintenance expense is minimized, wherever Crapo HTL-85 and Crapo HTL-135 High-tensile, Low-resistance Line Wires are used. These revolutionary wires, with their superior strength, make possible rural lines with span lengths one and one-half to two and one-half times greater than were practical heretofore.

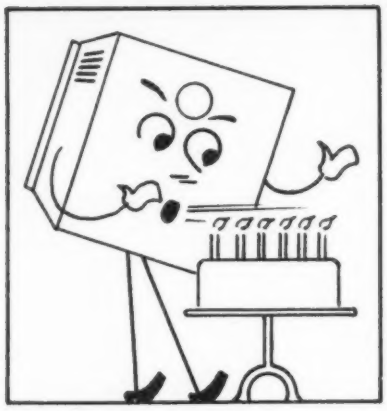
Crapo HTL-85 permits spans to 225 feet in heavy, 325 feet in medium, and 375 feet in light loading districts; provides stronger spans on existing pole structures.

Crapo HTL-135 makes possible spans of from 350 feet in heavy to 500 feet in light loading districts. Both wires possess superior telephonic transmission qualities.

Write for complete technical data and construction practice information!

INDIANA STEEL & WIRE CO.
MUNCIE, ◆ INDIANA

Manufacturers of
Crapo Galvanized Telephone Wire
Steel Strand, Tie Wire,
Construction Wire.



Raytheon RectiFilteRs have been in service six years. Actual performance records of many telephone companies have proved these units to be the most satisfactory and economical way of supplying DC to PBX and PAX boards. Plug in a RectiFilteR and forget it.

Raytheon RectiFilteR

Each RectiFilteR installation saves from $30 to $90 a year. Eliminates trouble and expense of frequent routine inspections. Equipped, when necessary, to furnish DC power during AC interruption. Full range of sizes. Write for bulletin DL-48-156F

RAYTHEON MANUFACTURING CO.
172 WILLOW STREET, WALTHAM, MASS.

In the Nation's Capital

(Continued from page 22)

through under the protective coloration of national defense. But, by and large, it will be pretty hard for the public ownership crowd to make out much of a case for the government laying out money for ordinary gas, electric, or telephone or transportation facilities. The Army and Navy, which will be in practical control of the national defense program, are much more disposed to make the best of existing utility facilities and go on from there.

HOWEVER, there is no doubt that a long-range trend towards some form of national socialism is in the air. This is not the kind of socialism whereby the government would own and operate private enterprise—as in Soviet Russia. It is (with all due respect) more in the direction of the Rome-Berlin idea, whereby the government will assume more and more control, direction, and regulation—without assuming responsibility of ownership. In other words, it will say to business (all major business—not just utilities): "You keep your cows and feed them but give us the milk."

This is a long-range trend and won't happen today or tomorrow. It is conceivable that if the war situation clears up rapidly and if conservative influences capture Congress in 1942, this trend towards socialistic regulation of business will be checked. It is barely possible that it might even be reversed, as happened in the Harding reaction which followed the Wilson war-time regulation of two decades ago. But there are too many "ifs" in that combination for the business man to put very much faith in it.

It is more practicable to expect regulation of the future will assume the form in which it is now exercised over banking. At any rate, it is likely to drift in that direction. In banking regulation, as you are probably aware, the supervising authorities have powers of "visitation and examination." Through the Federal Reserve system, private management is so restricted that it depends on the government for even details of lending and spending policy.

Utility industries which must plan for the future would be well advised to consider this trend and consider, moreover, just how the banking type of regulation would affect them if applied. This does not mean that private profit and capitalistic enterprise are all washed up or even languishing. It simply means that in addition to being an umpire, the government is gradually moving into a more or less "silent partner" relationship with all forms of business.

COMING BACK to our own field, the Federal Communications Commission held hearings last week in the complaint of the Washington Department of Public Service against the Pacific Telephone & Telegraph Co. Although the issue involves only a question of toll rate policy on the Pacific coast, this promises to be a rather important case because it is the first in which the FCC has been called upon to exercise its rate-making power by formal order upon a formal record. Also, there appeared, in addition to the complaining Washington Department of Public Service, the National Association of Railroad & Utilities Commissioners and the commissions of the states of California, Idaho, Nevada, and Oregon.

The complaint is based upon the failure of the Pacific Telephone & Telegraph Company to reduce its toll rates for its "interstate Pacific" division to a level comparable with "other interstate" toll business. The difference between the two classes is that the Pacific-interstate applies to calls confined to its own system.

The Washington regulatory body contended that this differential constitutes a discrimination in violation of Section 202(a) of the Federal Communications Act. The company defends on grounds that a reasonable classification of business in which cost factors can be proven to be dissimilar is not a discrimination. In support of this the company's counsel cited railroad decisions of the Interstate Commerce Commission.

John E. Benton, general solicitor of the NARUC, called upon the commission to reject the precedent established in the railroad rate cases. He urged this not because he thought such decisions were necessarily bad law, as applied to railroad regulation, but because of an inherent distinction which he perceived between railroad operations and telephone operations. Here is an interesting passage from Judge Benton's brief:

> Telephone companies were not engaged in transporting commodities sold by their patrons. They were engaged in transmitting the sounds of the hu-

XUM

ROBBING PETER TO PAY PAUL

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines

"A SMALL debt produces a *debtor;* a large one an *enemy.*" The person who runs into debt, especially for something which his income does not provide, at least, under the present and future uncertain circumstances, gives his creditor power over his freedom and peace of mind. Not that his creditor has any thought or desire to press him unduly for a settlement—because all the creditor wants is a good customer, and, of course, a prompt-paying and satisfied customer. This is the way the average customer and creditor both feel.

But most of us, let us confess, have at one time or another, gone beyond our means to buy something we want but cannot afford. The result is, if we cannot pay a bill when it is due, that we make silent acknowledgment to our creditor that we really obtained the goods under false pretenses. *Yes, we did,* because you know as well as I do, that we would be obliged to "Rob Peter to pay Paul," if we had to pay the bill when due. Then someone else would have to wait, so we would be no better off.

Consequently, we would be ashamed to meet our creditor and so would avoid him, if possible, until we could see our way clear to settle with him. Why, we sometimes even find ourselves, in such a case, concocting poor, pitiful excuses to our creditor, which we must bolster up with an untruth in order to make them sound plausible. (Slightly exaggerated? I wonder.)

Someone has said, "The first step in debt is like the first step in falsehood, involving the necessity of going on in the same course, debt following debt, as lie follows lie."

Webster says, "An unpaid bill is a debt."

Our creditor says, "I'm glad of your patronage, but want you for a satisfied customer rather than a dodging debtor."

And the Bible says, "Forgive us our debts." But until we pay them we cannot expect to be forgiven, if we treat them lightly.

man voice, for the countless different purposes for which the members of society desired to communicate with each other—for business, political, religious, scientific, and purely social purposes.

The right of all patrons of telephone companies to equality of treatment Congress intended to protect; for this purpose it included Sec. 202(a) with its anti-discrimination provisions. Congress, however, must have known that, if unequally treated, patrons could not show identity of service — from the same origin point to the same point of destination over the same line. Congress must have known, too, that telephone patrons could not show competition of the sort shown by shippers of freight, with resulting damage from unequal rates. Every telephone station in a private home or business office receives an individual service, from an individual point of origin to thousands of different points of destination, and over countless different combinations of lines.

The telephone patron seldom sells his words spoken over the telephone, and never sells them competitively.

To talk of applying to the regulation of the charges for transmission of spoken messages the rate-making principles which apply to the shipment of freight commodities is the height of absurdity.

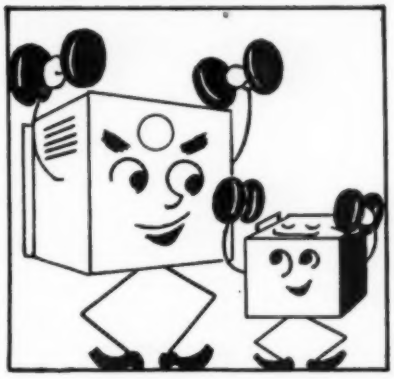
As a betting proposition, it seems that the complaint of the Washington Department of Public Service is likely to be sustained by the FCC. However, that will be only the first step in an important task which the FCC must take upon itself if it throws overboard the regulatory policies already charted by the Interstate Commerce Commission with respect to interstate utility regulation.

▼ ▼

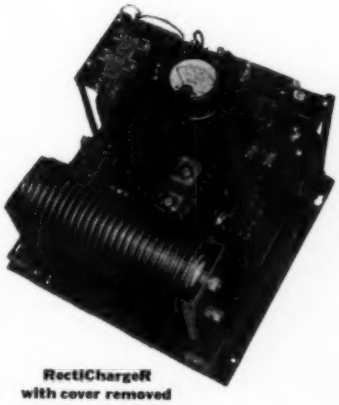
General Telephone Corp. Shows October Gain

General Telephone Corp. reports for its subsidiaries a gain of 2,424 company-owned telephones for the month of October as compared with a gain of 1,616 telephones for the month of October, 1939. The gain for the first ten months of 1940 totals 24,116 (exclusive of purchases or sales) or 4.79 per cent as compared with a gain of 19,914 telephones or 4.33 per cent for the corresponding period of 1939.

The subsidiaries now have in operation 527,201 company-owned telephones.



Batteries stay fit, never get exhausted or over-charged with a Raytheon RectiChargeR on the line. Result: longer battery life, lower maintenance, and reduced power bills. RectiChargeRs maintain proper charging rate regardless of voltage variations in the AC supply. Set them and forget them.



RectiChargeR with cover removed

A RectiChargeR with a small storage battery floating across its terminals makes a complete, automatic, AC-DC, constant-voltage telephone power unit. Components are long-lived, maintenance-free. Consult your usual source of telephone supplies for the correct RectiChargeR for your needs. Write for bulletin DL-48-263AT

RAYTHEON MANUFACTURING CO.
172 WILLOW STREET, WALTHAM, MASS.

XUM

The
NEW BATTERY
to meet today's telephone demands

Season after season, month after month, long after the time you expect ordinary telephone batteries to signal feebly for replacement, Ray-O-Vacs carry on, full-powered and hearty. They cost no more---but how they cut down replacement costs.

RAY-O-VAC COMPANY
Formerly FRENCH BATTERY CO.
MADISON - WISCONSIN

Principles of Salesmanship

(Continued from page 24)

so, until you can outweigh his objection, nothing you can say will be of avail. There is an arch missing from your bridge. But if you say, "You agree, don't you, Mr. Smith?" or "That's right, isn't it?" then, if he has a reservation he will state it.

Suppose he says: "Well, I don't know; I doubt if the extra cost would be justified." There, he has told you where your obstacle lies! And you can go to work on it. Instead of striving against an unknown resistance, you have it out on the table and can deal with it.

Sales authorities designate this second principle as "The Three-Step Selling Process"—offer an advantage, prove the advantage, secure an acceptance or agreement.

For example, "Here is a suit that will hold a press much longer than the ordinary weave" (advantage). "The reason for this is that it is woven much more tightly than the ordinary worsted" (proof). "You want to save on your pressing bills, don't you, Mr. Customer?" (agreement).

Perhaps he doesn't warm up to the idea. Possibly he would be more interested in style (pride) or long wear (profit-economy), etc. So you state the pride and profit advantages, prove them, and ask for agreement.

Thus you see that this *three-step selling process* not only identifies the strongest buying motive for you, but also tells you whether your proof has been accepted or whether you must bear down harder with additional proof.

The Third Principle of Salesmanship

When you bought your morning newspaper, if you gave the act any thought at all, you would consider it to have been the result of one decision. But if this decision is cut up, like a laboratory specimen, it would be found to consist of *five* separate and distinct decisions.

All five decisions must be made positively in every sale; if one is missing—no sale. They may be pretty well telescoped, but they are all there. Here they are:

(1) I need, or want, this article or service.

(2) It is worth the price asked.

(3) I will buy this brand, or from this company.

(4) I will buy it from this salesman.

(5) I will buy it now.

Take that morning newspaper—you want it. You are willing to pay the price asked, you buy the Tribune in preference to other papers, you prefer to buy it from Tony, and you want it now. If you don't like the Tribune, or Tony, or consider the Herald equally as good for a cent less, this transaction would be entirely different. So you see there are always five decisions. They are not always of equal force or importance.

Take the telephone. If there is no competition, No. 3 might not be a factor; but as for No. 4, it is within the realm of possibility that one might refuse to subscribe, or stop his service through dislike of the telephone company personnel.

No. 1 is, of course, the first and essential decision. But it isn't sufficient. No. 2 can well be a factor. One might *want* a telephone, but consider the cost prohibitive. No. 5 gives the other decisions effect—the subscription is to be *now*, not at some indefinite time in the future.

Thus the telephone salesman has, first, the responsibility of winning the goodwill of the prospect for his company and for himself to insure decisions Nos. 3 and 4. Then he turns loose his direct salesmanship on decisions Nos. 1, 2, and 5. They must be made in consecutive order. We must need or want the telephone before we care what it costs, and will consider the cost only in relation to this need.

Rule-of-thumb salesmen often complain that they cannot get *action* (No. 5). This is because there is a missing or weak span in their bridge. They haven't sold the need or the price in relation to the need.

The Selling Formula

The foregoing is but the stripped chassis of the selling process. There are endless ramifications and adaptations which would require a fat textbook to cover, and which cannot be dealt with here. We can, however, weld these three basic principles of salesmanship into a complete formula which *must* be followed in *every* successful sale—whether this is done consciously as a matter of plan, or unconsciously as a matter of instinct:

(1) Offer your prospect a specific advantage or profit based upon the buying motive or motives you

XUM

consider to be applicable to the individual prospect's needs.

(2) Prove every advantage or profit you offer in specific terms and be sure that this proof is accepted.

(3) Start with the First Buying Decision and be certain that you secure this—the sense of need or want—before you talk cost, Decision 2. Buying decisions are always made in the order given and should be so presented.

Whatever there is of order and coherence in this world is held together by a structure of principles. The symphony that holds us all in thrall and is seemingly all emotion and feeling, is built upon a structure of principles just as rigid and definite as the multiplication tables. So are all the transactions and relationships of life, of which selling is such an important one.

As the old salesman says, we cannot sell every prospect. There is no "sure-fire" system, and the deviations of method and application of principle vary about as widely as do people. But we can always *try* to conform to the principles, and out of this trying arises salesman*ship*.

In conclusion, if you want a negative formula—a positive in reverse—never ask anyone to buy anything simply because you want him to do it. He won't.

▼ ▼

"How to Report Fires" Given on Directory Cover

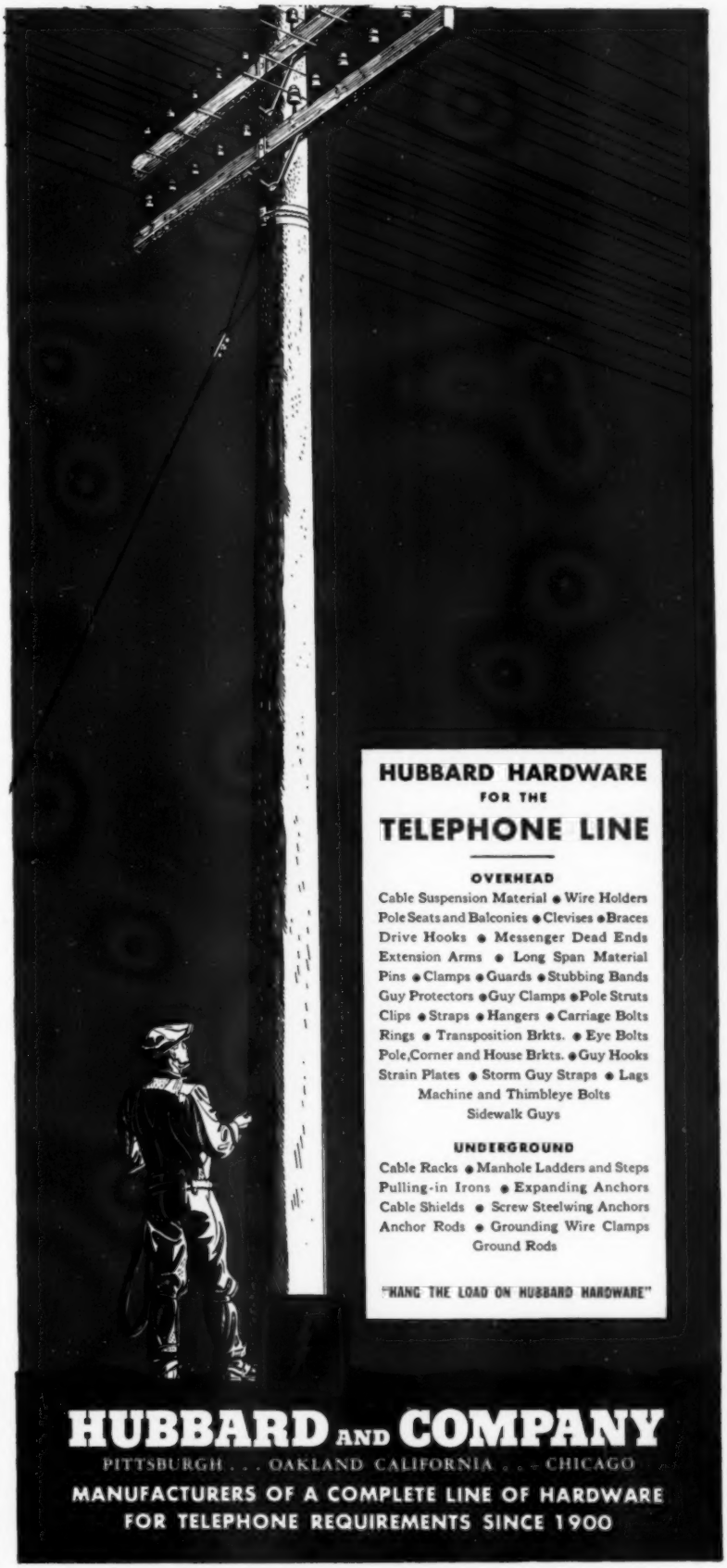
The new Palmyra, Mo., directory of the Western Light & Telephone Co. includes instructions for calling the fire department printed in red on the front cover. The instructions are for persons reporting alarms to call Central, who will in turn call the members of Palmyra's volunteer fire department. Names of all the firemen are listed over the switchboard.

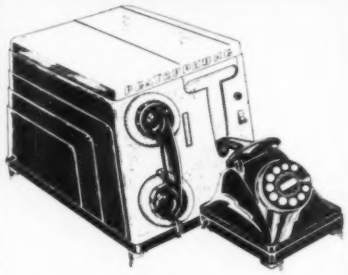
The new arrangement was made by the company in cooperation with the city council, in order to give residents of Palmyra quicker and more efficient fire service.

▼ ▼

Independents Buy Bell Minority Stock Interests

Announcements have been made by the Meadville Telephone Co. and the Home Telephone Co. of Ridgway, Pa., of the acquisition of substantial blocks of stock in their respective companies formerly held by the Bell Telephone Co. of Pennsylvania. This stock will be distributed among local investors, which will render these companies wholly Independent-owned.


HUBBARD HARDWARE
FOR THE
TELEPHONE LINE
OVERHEAD
Cable Suspension Material • Wire Holders
Pole Seats and Balconies • Clevises • Braces
Drive Hooks • Messenger Dead Ends
Extension Arms • Long Span Material
Pins • Clamps • Guards • Stubbing Bands
Guy Protectors • Guy Clamps • Pole Struts
Clips • Straps • Hangers • Carriage Bolts
Rings • Transposition Brkts. • Eye Bolts
Pole, Corner and House Brkts. • Guy Hooks
Strain Plates • Storm Guy Straps • Lags
Machine and Thimbleye Bolts
Sidewalk Guys
UNDERGROUND
Cable Racks • Manhole Ladders and Steps
Pulling-in Irons • Expanding Anchors
Cable Shields • Screw Steelwing Anchors
Anchor Rods • Grounding Wire Clamps
Ground Rods
"HANG THE LOAD ON HUBBARD HARDWARE"
HUBBARD AND COMPANY
PITTSBURGH . . . OAKLAND CALIFORNIA . . . CHICAGO
MANUFACTURERS OF A COMPLETE LINE OF HARDWARE
FOR TELEPHONE REQUIREMENTS SINCE 1900



The Peatrophone

"The Mechanical Secretary."

Write us today for our leasing plan which makes Peatrophone service obtainable by your subscribers for a small monthly rental without investment by you.

Peatrophone Corporation

342 Madison Avenue
New York, N. Y.

"A 100% Accurate Book"

"We know from our past experience that your achievement of publishing a 100% accurate book is not an easy one, and we realize that you are able to do such excellent work only by giving the most careful attention to every detail."

Quoted from an unsolicited letter from the manager of a good-sized Eastern telephone company whose semi-annual directory we had recently delivered. (Name, etc., on request.)

Maybe we'll never do it again. But we'll always be trying. We aren't big enough to handle metropolitan directories. But those 2-column, 6⅛x9¼ or 7¼x10¼ sizes are right down our alley—serving 88 exchanges in 6 states—and looking for more.

E. W. STEPHENS COMPANY,
Columbia, Missouri; printing (especially directories), book manufacturing.

News Brevities

New Companies and Incorporations

Ritzville, Wash. — The Marcellus-Packard Telephone Co. has been incorporated by S. J. Williams, Edmond Meyer, Robert E. White and others.

Financial

Omaha, Neb. — The Northwestern Bell Telephone Co. on October 1 paid to the city $33,348 on its 4½ per cent occupation tax for gross local income through rentals and tolls for the July-September quarter. Reported taxable income included $728,508 from rentals and $56,155 from tolls.

Franchises

Waco, Texas. — The Southwestern Bell Telephone Co. on October 1 accepted, subject to a referendum vote, the 25-year franchise granted it recently by the city commission. The proposed franchise levies a 2 per cent gross receipts tax in lieu of free telephone service now furnished the city by the company.

Telephones

Des Moines, Iowa.—The 50,000th telephone was recently installed here by the Northwestern Bell Telephone Co., giving the city one telephone for every 3.2 persons. The 20,000th telephone was recently installed in the company's exchange at Davenport.

Columbus, Ohio. — Stations of the Ohio Bell Telephone Co. in this city increased by 893 during October, making a total of 4,548 telephones installed in the first ten months of 1940. There are now 91,594 telephones in the Columbus area, the largest number in the company's history.

Construction

Charlestown, Ind.—The Indiana Bell Telephone Co. is installing a common battery switchboard here, replacing a magneto system. The improvement was planned to insure modern service in the area of a new government powder plant. A 320-line switchboard has been installed at the powder plant site.

Logan, Iowa. — The improvement program of the Boyer Valley Telephone Co. has been delayed because the manufacturer has been unable, because of large defense orders, to deliver the required apparatus as expected. The company's office has been completely remodeled.

Plainfield, Iowa.—Rebuilding of lines of the Iowa Public Service Co. and the Bremer-Butler Mutual Telephone Co. in east Plainfield will begin soon, and will be carried out as a joint enterprise.

Slater, Iowa.—The Slater Telephone Co. has purchased a residence near the central part of the town for use as a central office and home for the family in charge of the office.

Bay City, Mich.—An $800,000 dial telephone system being installed by the Michigan Bell Telephone Co. is nearing completion here. The company is sponsoring demonstrations of the new equipment to acquaint the public with its operation. A total of about 9,300 stations will be converted to dial operation.

Waskish, Minn.—Following a mass meeting, 42 subscribers voted three dollars each for materials and agreed to donate three days' labor each to rebuild the lines of the former Waskish township-owned system. The subscribers had previously attempted to have the lines opened through litigation, without success.

East Brady, Pa.—Installation of a dial system here by the Kittanning Telephone Co. has been delayed because of inability of the company to obtain the necessary equipment. Defense orders have reduced the manufacturer's stock.

Personals

Modesto, Ill.—At a recent meeting of the directors of the Modesto Telephone Co., the resignation of Manager Walter Meiher, who has held the post for 27 years, was accepted. His successor is Mrs. Bess Blauer.

Omaha, Neb.—Thomas H. Cranfield has been appointed engineering supervisor for the Northwestern Bell Telephone Co., and in addition will act as liaison representative for the company in connection with increasing army activity in the company's territory. Mr. Cranfield has previously held important executive positions in the engineering department.

Bellevue, Ohio.—John E. Wise, president of the Willard United Bank, Willard, was elected vice-president of the Northern Ohio Telephone Co., at the annual directors' meeting held here September 28. Mr. Wise fills the vacancy caused by the death of John P. Ruffing.

Miscellaneous

Reasnor, Iowa.—Mrs. Lilly Guthrie was named operator at the annual election of the Reasnor Mutual Telephone Co., on October 1. She succeeds Mrs. Minnie Preston who after 11 years of service declined re-election.

Mrs. Mabel DeMoss and daughter, Helen, were named secretary, William McConeghey, president, and George Tool, vice-president. G. M. Byers was re-elected lineman.

Bassett, Neb.—J. W. Richmond, former manager of the Cuming County Telephone Co., Wisner, Neb., has purchased the exchange at Bassett, formerly owned by P. W. Coryell. Mr. Richmond has been prominent in telephone association work in Nebraska.
DOBBINS———

Waynesburg, Pa.—The Dunkard Valley Telephone Lines have been sold by John Taylor, Garrison, to Dr. E. W. Rose, of Hundred, W. Va.

The switchboard at Garrison will be removed to Deep Valley and patrons will be given day and night service.

Obituary

Erie, Pa.—William Leroy Cross, for 27 years a foreman for the Pennsylvania Telephone Co., died October 28 after a brief illness. He was 58 years old.

Commission and Court Activities

U. S. Supreme Court Again Denies Bell Appeal

The U. S. Supreme Court on November 11 denied a petition for rehearing on its recent dismissal of an appeal by the Southwestern Bell Telephone Co. against two Arkansas restaurant keepers. (TELEPHONY of October 26.) The company is required by a decision of the Arkansas Department of Public Utilities to furnish service at the same rate available to other subscribers, notwithstanding the fact that the telephones are used indiscriminately by cafe patrons.

▼ ▼

Remove Restrictions on "Foreign Exchange" Service

The New England Telephone & Telegraph Co. has proposed to the Massachusetts Department of Public Utilities that customers in Granville, Stoughton, Andover, Hudson and Lowell using "foreign exchange" service be given the option of subscribing to an unlimited calls service, at a rate of $1.20 per month per quarter mile of line on their foreign service. The present rate for limited calls is $1.00 a quarter-mile.

The company's announcement that it looks forward to a change in rates offsets petitions from the five municipalities for removal of restrictions on number of calls permitted each month under foreign exchange service.

▼ ▼

Approve Policemen as Telephone Operators

Justice Charles B. McLaughlin of the New York Supreme Court, first district, on November 1 upheld the use of patrolman eligibles as telephone operators in the New York City Police Department. The court decided that Police Commissioner Valentine had amply sustained the point that "knowledge of police work is a most important qualification for a telephone operator in the police department."

The court justice denied an application by Seymour Friend and 87 other eligibles on the civil service list for telephone operators in the city employ. As reported in TELEPHONY of November 9, the petitioners had asked the court to restrain the commissioner from continuing to use patrolman eligibles as telephone operators and to substitute persons from the civil service list.

Justice McLaughlin said that the certification by the municipal civil service commission of persons on the eligible list of patrolmen for the telephone jobs did not appear to the court to be unreasonable or capricious.

▼ ▼

Nebraska Company Asks Rate Increase; New Service

The Union Telephone Co. has asked approval of the Nebraska Railway Commission for an increase in rates from $2.00 to $3.00 on individual business telephones and from $1.40 to $2.00 on individual residence service at its Wausa exchange. E. C. Hunt of Blair is general manager of the company.

Authority was also asked to change from magneto equipment to the automatic ringing type. A canvass of the 192 subscribers resulted in 186 of them signing a petition, filed with the application, consenting to the increase in rates when the change of service is completed.

▼ ▼

Subscribers Protest Rate Increase by Ohio Company

A hearing on the application of the North East Ohio Telephone Co., filed recently with the state public utilities commission, seeking authority to increase its rates in a number of its exchanges in the northeastern section of the state was held on November 8. It was revealed that protests had been received from a number of individual subscribers, also from the village of Jefferson, the Jefferson Grange, and the Commercial Club of Kinsman. At the conclusion of the hearing the commission took the matter under advisement.

The company is seeking rate increases for the exchanges at Andover, Courtland, Jefferson, Orangeville, Bristolville, Green, Kinsman and Wayne.

▼ ▼

State Treasury to Get Rate Case Refunds

The Oklahoma Corporation Commission on November 13 ordered $34,638, representing 10 per cent of the refunds collected from the Southwestern Bell Telephone Co. in the Tulsa and Okla-

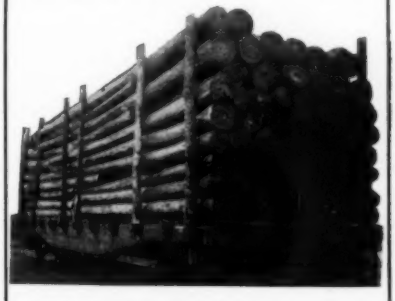
It's not the color

—it's the stamina within the pole that counts . . . that measures the service. Enduring and strong our poles of

NORTHERN WHITE CEDAR

deliver most for the money. No other pole can give you quite so much in real economy and lasting satisfaction.

Specify our sturdy *North-of-Mackinaw* Cedar . . . Use these good poles always.



QUICK SHIPMENTS—TREATED OR PLAIN

MICHIGAN POLE & TIE CO.

NORTHERN AND WESTERN POLES

NEWBERRY
GRAND RAPIDS
MICHIGAN

XUM

TELEPHONE
DIRECTORY
PRINTING

YOU WANT
ACCURACY
ECONOMY
EFFICIENCY

THEY WANT
DURABILITY
LEGIBILITY

The Cuneo Press, Inc. — producing telephone directories for large and small cities — has the experience and equipment to properly handle your directory.

THE CUNEO PRESS INC.
CHICAGO, ILL.
WITH CONVENIENT PLANTS
NEW YORK PHILADELPHIA
MILWAUKEE

Specify
SEYLER POLE LINE HARDWARE

We have, for twenty years, manufactured a complete line of Pole Line Hardware. Our line is complete and is quality material.

We have, throughout these twenty years, marketed our product under the trade name of others. As of this year, we discontinued selling through other manufacturers, and are now offering our materials under our own trade name.

As a user of the above commodities, as well as Galvanized Strand (Guy Wire), Chance or Everstick Anchors, Copperweld Rods and Clamps, we are quite eager to obtain a portion of your purchases, and will greatly appreciate receiving your inquiries and the opportunity of quoting.

We assure you, any business given us will be given prompt attention, and your valued business appreciated.

SEYLER MFG. CO.
Pole Line Hardware and Construction Specialties
PITTSBURGH, PA.
SHARPSBURG POST OFFICE

homa City rate cases, to be transferred to the state general revenue fund.

This action followed a decision of the Oklahoma Supreme Court, reported in TELEPHONY of November 9, which, in the case of Sadie E. Crawford et al v. Oklahoma Corporation Commission, held that the commission — under a 1915 state statute — is authorized to deduct 10 per cent of telephone refunds and turn the money into the state treasury.

▼ ▼

Bell Will Buy Property of Minnesota Independent

The Minnesota Railroad & Warehouse Commission on November 13 authorized the South Pokegama Cooperative Telephone Association to sell its property, located in Itasca county, to the Northwestern Bell Telephone Co.

The South Pokegama cooperative group owns 17.2 miles of rural line, which is connected to the Northwestern Bell company's Grand Rapids exchange. The commission found that the South Pokegama company was financially unable to render the service which its patrons desired and needed.

▼ ▼

Must Practitioners Before Commissions Be Lawyers?

The Nebraska Supreme Court has taken under advisement the question, raised in the case of C. E. Childe, Omaha (Neb.) rate expert, of whether all persons presenting complaints or cases before the state railway commission must be licensed attorneys. Nebraska telephone companies are interested because many of their matters are presented to the commission for them by George E. Kloidy, secretary of the Nebraska Telephone Association, who would be hereafter barred if the attorney general is sustained in his prosecution of Mr. Childe.

It was argued on behalf of the latter that the Nebraska State Railway Commission is an independent constitutional tribunal having plenary power with reference to the control and regulation of common carriers and, in the absence of constitutional or legislative restraint, has full power to determine its own rules of practice and procedure relating to the exercise of its legislative functions, including the determination of the qualifications of practitioners appearing before.

It was urged that the commission's procedure is not subject to judicial control or direction so long as constitutional limitations are not transgressed. It follows that the inherent right of the supreme court to define and regulate the practice of law does not embrace the right to regulate the appearance of practitioners before the railway commission.

It was pointed out that ever since the commission was created in 1907 it has invited and permitted persons unlicensed to practice law in the state to appear before it, as counsel for all interested parties and has recognized their right and authority to draw up complaints, answers and other documents, to conduct examination of witnesses, make arguments and file briefs.

The argument was also advanced that to acquire the knowledge and skill possessed by these persons requires years of study and a knowledge of the business affected, and that outside of the lawyers who devote all or the major part of their time to the interests of common carriers, there is no lawyer in the state similarly qualified.

Representatives of 12 large corporations petitioned the railway commission to amend its rules of procedure to make it clear that rate experts are qualified to appear before it and represent clients, and also to intervene in the Childe suit.

▼ ▼

Bell's South Carolina Rural Rates Reduced

The South Carolina Public Service Commission has ordered a reduction in the mileage rates applicable to rural or multi-party service of the Southern Bell Telephone & Telegraph Co.

The commission pointed out that the effect of the order will be to reduce substantially the cost of telephone service to farmers and others residing in rural areas, thereby making it possible for many people to have telephone service who have not had it heretofore.

Rural line mileage charges at present are 25 cents per month per mile or fraction thereof for each main station, beginning at two miles from the base rate boundary of the exchange from which service is received.

Under the new schedule, service will be furnished for distances beyond the first two miles of such boundary and up to four miles for the initial mileage charge of 25 cents. For distances between four and seven miles of such boundary the mileage charge will be 50 cents, while beyond seven miles from the boundary a maximum mileage charge of 75 cents will apply.

As an example of the extent of the reductions involved, a rural line customer connected to the Columbia exchange and residing a distance of ten miles from the base rate boundary of the exchange at present pays the basic rate of $2.25 plus a mileage charge of $2.00, or a total rate of $4.25 per month. Under the new schedule this

customer will pay a total of only $3 per month, which represents a reduction of $1.25 per month. The total savings to rural line customers throughout the state, according to the commission, will amount to several thousands of dollars per year.

Recently several rural lines have been built by the Southern Bell under new methods of construction, including long-span construction, on an experimental basis. In those cases the reduced schedule of rates now ordered were tentatively authorized by the commission. The benefits of these developments are now being extended to all of the Southern Bell company's present and prospective rural line customers throughout the state.

▼ ▼

Company Asks Increases at Three Exchanges

Pleading insufficient earnings on the present rates charged for telephone service, the Ohio Associated Telephone Co. on November 15 filed an application with the state public utilities commission to increase rates at its Scott, Yorkshire and North Star exchanges. The changes proposed are as follows:

Scott exchange present rates are: Village service, independent business line $1.75, residence $1.25. Rural service, business $1.75, residence $1.25. Proposed rates: Business independent, $2.50; business two-party, $2.00; business rural and residence independent, $2.00; residence four-party, $1.50; residence rural, $1.50.

Yorkshire exchange present rates are: Town independent line, $2.25; rural business, $2.25; residence $1.25. Proposed rates: Business independent, $2.50; business two-party, $2.00; business rural, $2.00; residence independent, $2.00; residence four-party, $1.50; residence rural, $1.25.

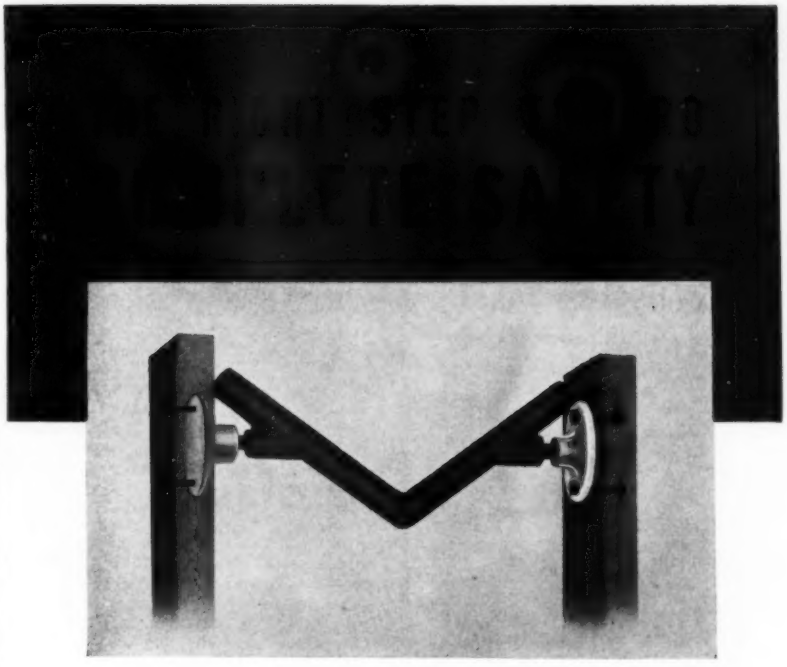
North Star exchange present rates are: Village independent, $1.50; 10-party line, $1.25; rural 20-party line, $1.25. Proposed rates: Business independent, $2.50; business two-party, $2.00; business rural, $2.00; residence independent, $2.00; residence four-party and residence rural, $1.25.

▼ ▼

Summary of Commission Hearings and Rulings

Federal Communications Commission

November 13: Authorized Postal Telegraph-Cable Co. (Del.) to extend its telegraph and telephone lines into state of Louisiana by acquiring the lines, property and franchises of the Postal Telegraph-Cable Co. (La.) and to operate them as a telegraph and telephone carrier to and from every point now served by the Louisiana company.



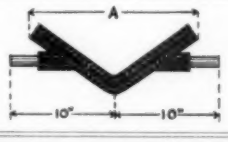
U-S SELF-CENTERING SAFETY TOP RUNG

A safety device designed to insure maximum safety and protection to ladder users. A ladder equipped with this Safety Top Rung will not sway or tilt when used against trees, poles, corners of buildings, etc.

The "V" shape of the rung and its pivoted supports afford a safe and secure working ladder.

The Safety Top Rung is solidly constructed. Rubber covered. Furnished complete with all parts for mounting on ladder. Available in sizes listed below. Sample sent on memo billing.

UTILITIES SERVICE CO.
ALLENTOWN, PA.



Stock No.	A—Inches
893	13
893-A	11
893-B	10

UNINTERRUPTED SERVICE
— Clearer Lines

with

NON-GROUNDING RARE GAS ARRESTERS

Used for many years by leading Railroads for vital Telephone, Telegraph and Signal Circuits.

Type MCD (illustrated) interchangeable with your present carbon block protectors.

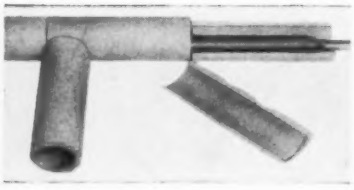
Write for Catalog 39-A describing

Arresters
Anti-Noise Relays
Terminal Strips
Potheads
Housings

L. S. BRACH Mfg. Corp.
55-63 Dickerson St. Newark, N. J.
Signal Circuit Engineers Since 1906

Announcing —

A new underground cable system. Safe, reliable, accessible. Low cost installation.



Write for Complete Information

THE TELE-TILE COMPANY
West Bend, Iowa

Illinois Commerce Commission

November 15: Authorized Wabash Telephone Co. to issue first mortgage 3½ per cent 25-year bonds, in the principal amount of not more than $450,000. The proceeds will be used to purchase 2,500 lines of automatic central office equipment, for automatic subscribers' station equipment, for a portion of a building to house automatic central office, and for new toll switchboard equipment at the company's Bloomington-Normal exchange.

November 16: Illinois Bell Telephone Co. filed addition to its tariff providing for the establishment of regulations and rates for loudspeaker-microphone sets to be used in connection with intercommunication equipment.

November 19: Hearing at Springfield in matter of proposed advance in rates for telephone service by the Farina Mutual Telephone Co. in Farina.

November 20: Hearing at Springfield in the matter of citation by the commission of the Illinois Commercial Telephone Co. to show cause why there should not be a reduction in rates for telephone service furnished by the company.

November 20: Hearing at Springfield on application of Illinois Commercial Telephone Co. for permission to increase rates for service at Bement, Carlock, Deland, Lawrenceville, Monticello, Piper City and Roanoke.

Indiana Public Service Commission

November 14: Petitioned by Indiana Bell Telephone Co. for permission to sell $4,000,000 of common capital stock as reimbursement for the cost of additions to the plant and equipment in the last five years. Plans call for the sale of 40,000 shares at $100 par to the American Telephone & Telegraph Co.

Kansas Corporation Commission

November 12: Hearing held on application of Southwestern Bell Telephone Co. for authority to file and put into effect a new schedule of rates at Scott City and vicinity.

December 2: Hearing on application of Central Kansas Telephone Co. for permission to make changes in rates for telephone service at Kechi and Whitewater.

December 3: Hearing on application of Western Light & Telephone Co. for permission to make changes in rates at Argonia and vicinity, and at Norwich and vicinity.

December 17: Hearing on application of McKrae Telephone Co. for authority to abandon exchange now furnishing telephone service at Coyville.

December 17: Hearing on application of Norton County Co-operative Telephone Co. to discontinue operation of exchange boards at Norcatur and Oronoque, and to transfer lines of the affected subscribers to the Norton and Clayton exchanges.

Michigan Public Service Commission

November 25: Hearing at Lansing on application of Tri-County Telephone Co. for authority to issue and sell securities.

November 25: Investigation at Lansing into division of territory between the Fostoria exchange of the Chambers Telephone Co. and the exchange of Michigan Bell Telephone Co.

Answers to Traffic Questions on Page 33

1. No.
2. You say "Ring" if you have reached your destination and wish to reach them again. You say "AG" if you have never reached your destination.
3. Ring at ten-second intervals for one minute. If the called number has not answered at the expiration of this period, pass a "Don't answer" report.
4. The day rate, the time in effect when conversation started will apply on the call.
5. The intermediate operator should call you. If she fails to do so at the end of 20 minutes, refer the case to your supervisor or chief operator. Do not "AG" the call order unless your chief operator or supervisor authorizes you to do so.

Minnesota Railroad & Warehouse Commission

November 13: Granted authority for South Pokegama Cooperative Telephone Association to sell, and Northwestern Bell Telephone Co. to buy, the telephone property of the former company in Itasca county.

Ohio Public Utilities Commission

November 14: Issued amended order authorizing new St. Paris Telephone Co. to purchase the property of the Farmers & Merchants Telephone Co. of St. Paris for $57,714, by issuing and selling at par a first mortgage five-year note of $19,000 and at $50 per share, 774 shares of no-par common stock.

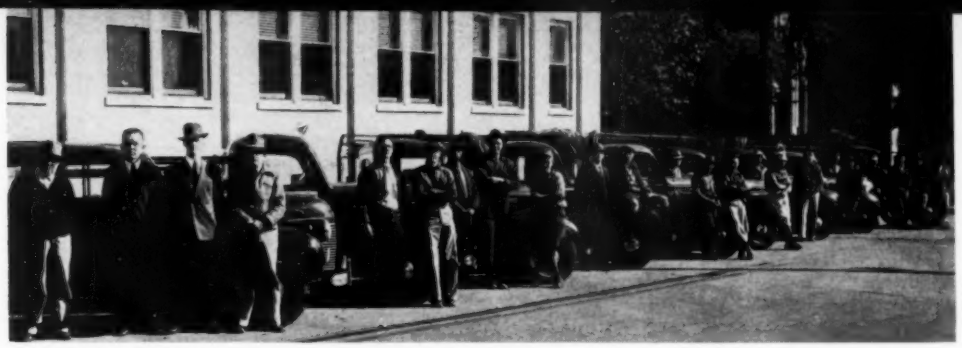
November 15: Application filed by Ohio Associated Telephone Co., for permission to raise rates at its Scott, Yorkshire and North Star exchanges. Company states earnings from present rates are insufficient.

Oklahoma Corporation Commission

November 13: Ordered transferred to the state general revenue fund $34,638, representing 10 per cent of the refunds collected from the Southwestern Bell Telephone Co. in the Tulsa and Oklahoma City rate cases. State supreme court on November 9 held the commission is authorized to do this under a 1915 statute.

South Carolina Public Service Commission

October 29: Announcement made that a reduction had been ordered in the mileage rates applicable to rural or multi-party telephone service of the Southern Bell Telephone & Telegraph Co., effective as of billing dates in November. Between 1,500 and 1,900 customers are affected.



This photograph shows employes of the Standard Telephone & Telegraph Co. at Dothan (Ala.) who gathered for a district first aid and safety meeting. J. D. WATSON, second from left, gave first aid instruction to the other members of the group.

Here and There in the Field

Alabama Company Holds First Aid, Safety Meeting

Twenty-four male employes of the Dothan (Ala.) district of the Standard Telephone & Telegraph Co. attended a first aid and safety conference in Dothan, on November 8, and heard a talk by Ellis Fysel, field director of the American Red Cross, who demonstrated first aid in cases of shock and drowning.

J. D. Watson, one of the company's employes (second from left in the accompanying picture) had just completed a study course in first aid to prepare him to give instruction to the other members of the group.

At the same meeting all motor vehicles of the Dothan district were checked to make sure that lights, brakes, and horns were in good condition. The safety equipment of each vehicle, including first aid kits, rubber gloves, flares, red flags and other equipment, was also inspected.

At the conclusion of the gathering, all employes gave a voluntary safety pledge, promising that they would practice safety first on the highway and in their regular work at all times.

The photograph of the safety meeting was featured in a company advertisement in the local newspaper. "These men," the advertisement explained, "are working constantly to build new telephone lines and improve present lines. It is a pleasure to see our number of employes increase, and our motor fleet grow as we keep step with progress in the Wiregrass. We are prepared to serve you."

Holding safety first meetings from time to time is a regular policy of the Standard company, according to G. R. McKelvey, general manager. "We feel we can never relax our efforts along this line and must constantly emphasize safety in order to get our job done as it should be done, and with injury to no employe."

Emergency Tax Sought on Telephone Companies

State Senator Philip E. Nelson on November 18 declared he would renew his fight in the Wisconsin legislature for an emergency tax on telephone companies, in an effort to obtain relief funds for the 22 northern counties in the state.

Senator Nelson warned the county board of his home county, Douglas, that the state could not increase aids to the counties without the emergency tax, because "there just isn't any money to be had."

The 1939 legislature failed to enact the emergency telephone tax which was introduced early in the session by Senator Nelson.

Card Notifies Subscriber of Telephone Man's Visit

Repairmen of the Middle States Telephone Co. of Illinois use a simple and inexpensive card to leave messages for

SUB-CYCLE

The MODERN Method of Ringing
BUILT FOR YEARS OF UNFAILING SERVICE

Features Not Duplicated In Any Other Converter

30 Days Trial If Desired

Model "S"

PRICE $45.00

FIVE MODELS PRICED UP TO $113.50
ALSO PULSATORS

No Moving Parts

No Vibrating Contacts

No Routine Maintenance

No Radio Interference

Install It and Then You'll Realize Why There Are Thousands in Use

Descriptive Literature Upon Request
SOLD BY LEADING DISTRIBUTORS
LORAIN PRODUCTS CORPORATION, Lorain, Ohio

XUM

The Impedance Bridge (Concluded)

In operation, current from the 1,000-cycle oscillator passes into the junction of the A and X arms where it divides in proportion to the impedance of the two paths.

It then passes on through the other arms of the bridge where it again divides in proportion to the respective impedances of the B and the standard arms.

When the impedance of arm A is to the impedance of arm X as the impedance of arm B is to the impedance of the standard arm, there will be no difference in potential across the head receivers and no tone will be heard, thus indicating a balance. The reading of dial A will then indicate the inductance, capacity, or resistance (as the case may be) of the device connected to the X arm.

The reader who is interested in a more detailed and exhaustive discussion of the theory of the alternating current bridge is referred to the article by Prof. Arthur L. Albert entitled "Alternating Current Bridge Measurements" in the July 2, 1938, issue of TELEPHONY. In his discussion, Professor Albert explains how the equations of a direct current bridge are extended to cover alternating current measurements. The article is a good review of Wheatstone bridge fundamentals.

SPECIALISTS

IN REPAIRING AND REBUILDING TRANSMITTERS

Repair service for Transmitters, Receivers, Desk Stands and Wall Phones—Magneto or Common Battery.
Coil winding, enameling and general rebuilding of Telephones, Switchboards and Parts.
We carry in stock: NEW MOUTHPIECES, RECEIVER SHELLS, RECEIVER, DESK STAND AND SWITCHBOARD CORDS AND PLUGS.
The Finest Line of New Oak Telephone Cabinets for rebuilding Wall Phones and Desk Sets ever offered and at the lowest prices.—ANY QUANTITY ONE TO ONE THOUSAND.
Obsolete wall phones or parts rebuilt into modern wall or desk phones with new cabinets.

TELEPHONE REPAIR CO.
Daniel H. McNulty, *Manager*
Rogers Park Station Chicago

Maintenance of Electronic Power Supply Units

General

There are now various types of telephone apparatus that make use of high voltage power supply systems for converting alternating current into direct current. Typical examples are some telephone repeater and carrier units, tone oscillators used in transmission testing, etc.

This data sheet discusses typical faults that may occur in electronic power supply units and how to maintain these units. Some of the faults that most frequently develop are:

(1) An open circuit in wiring or apparatus.
(2) A short circuit in wiring or apparatus.
(3) A high resistance connection in wiring or apparatus.
(4) Defects such as gassy tubes, burned-out filaments, etc.
(5) Short-circuited filter condensers.

Several typical fault cases are described in the following paragraphs and the symptoms analyzed to determine the cause of the trouble.

Inadequate Voltage from a Power Supply Circuit—Case No. 1

The first trouble case to be analyzed deals with inadequate voltage from a power supply unit.

Refer to the schematic circuit of a typical full wave power supply system shown in Fig. 1, normally rated at 250 volts direct current output at 80 milliamperes. The repeater with which this power system is used fails to operate except at an extremely low volume. A voltmeter reading taken across the power supply bleeder resistor shows only 125 volts available, or one-half of the normal voltage. A visual observation of the full wave rectifier tube, which happens to be of the mercury vapor type, shows a blue glow in one plate section and none in the other. What is the most likely source of the trouble? The tube in question is a type 83 full wave mercury vapor rectifier type.

Solution: The fact that there is no "blue glow" in one of the plate sections of the rectifier tube indicates

either that one-half of the high voltage winding is open or that the lead connecting the high voltage winding to the tube socket has become disconnected. The current taken by the bleeder resistor and repeater tubes will normally give an indication of the current flow by the blue glow due to the ionization of the mercury vapor.

It should be noted that had the rectifier tube been a high vacuum type (containing no gas), observation of the tube action would not have indicated this type

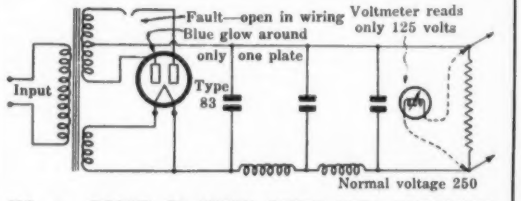


FIG. 1. CIRCUIT OF POWER SUPPLY WITH INADEQUATE VOLTAGE OUTPUT.

of fault. The fact that the voltage is one-half its normal value also points to one-half of the rectifying system being inoperative, thereby cutting the voltage in half.

When a transformer winding tests open, it will sometimes be discovered that the break in the winding may occur at the point where the flexible leads connect to the winding proper and in such cases the broken end can often be reached and a new connection established.

Hum Due to Defective Power Supply Circuit—Case No. 2

In the full wave rectifier circuit shown in Fig. 2, the voltage across the output is approximately 25 volts higher than normal, and considerable hum is observed in the output of the repeater to which the power supply is connected. To what does this abnormally high voltage reading point as the source of trouble? *(Fig. 2, and solution of case, will appear next week.)*

Middle States Tel. Co.

MESSAGE

.....19.....

M.....

The Telephone man was here today

TO REPAIR ☐

TO INSTALL ☐

YOUR TELEPHONE

Please Telephone DES PLAINES 600 PARK RIDGE 1110

and notify us when we can work on your premises.

MIDDLE STATES TEL. CO.

This card, carried by repairmen and installers of the Middle States Telephone Co. of Illinois, is slipped over the doorknob of an absent subscriber to notify him of the telephone man's visit.

Consulting Telephone Engineer

"Modernization of Equipment and Methods for Improved Service"

GARRISON BABCOCK

1104 Third Avenue, Seattle, Washington

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

C. M. Christiansen Co., Phelps, Wis.—Northern White Cedar Poles, plain or butt treated. Quotations on request.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

subscribers whom they fail to find at home, according to District Plant Superintendent George H. Eck, Des Plaines. The front of the message card is reproduced on this page; on the back of the card is simply the company's name, and "Message. See other side."

"These cards are carried by our installers and trouble men," explains Mr. Eck, "and when they get no response to the doorbell they hang a card on the doorknob."

Using these cards results in better public relations, Mr. Eck points out, because it is obvious to the subscriber that the company has been on the job and has attempted to do the needed work. The illustration shows the form used by the Middle States company, and may be of interest to other progressive Independent companies.

▼ ▼

"Trained Technique" of Telephone Service Complimented

Under the heading "Trained Technique" the October issue of the house organ, "CAPS and lower case," published by Jaggars-Chiles-Stovall, Inc., Dallas, Texas, pays tribute to the telephone workers.

"Probably no group of people in the world," says the article, "show the effect of careful training as do those who work for the telephone company. The minute you pick up your telephone you recognize that you are dealing with an efficient and trained organization.

"One of the cleverest things the operators do is to let you listen in on long distance calls so that you can give a quick decision as to whether you want to talk to the person answering or wait for the person called. Moreover, they let you hear why the person cannot be reached immediately instead of getting the information and then passing it on to you.

In this way, the telephone people perform their real service as intermediaries instead of putting themselves in the position of advisers.

If, for any reason, a wrong number is called at the other end, the operator immediately disconnects you from listening in. The telephone company takes no chances on human nature. A disgruntled voice over the wire is not a pleasant thing for a customer to hear. So, they let you hear only the good things in life. The bad they absorb themselves."

It is pleasing to telephone managers and operators to learn that their efforts to make telephoning a pleasant experience are recognized and the results complimentarily publicized by one firm that speaks from experience and observation.

THE AMERICAN APPRAISAL COMPANY

Appraisals • Continuous Property Records • Original Cost, Depreciation, and Rate Studies

CHICAGO • MILWAUKEE • NEW YORK

Telephone Directory ADVERTISING

Write or telephone for proposition

L. M. BERRY & CO.

Call L.D. 16, Telephone Bldg., Dayton, O.

Frank F. Fowle & Co.

Electrical and Mechanical ENGINEERS

35 East Wacker Drive CHICAGO

ACCOUNTING

HERDRICH and BOGGS

Certified Public Accountants

803 Electric Building

INDIANAPOLIS, IND.

SLOAN & COOK

CONSULTING ENGINEERS

120 SOUTH LA SALLE STREET

CHICAGO

Appraisals—Original Cost Studies Depreciation, Financial, and Other Investigations

DISTILLED WATER

FOR 2c A GALLON BY

PEERLESS STILLS

USED BY STATE AND GOVERNMENT

SPARTA Manufacturing Co.

SOUTH BEND, INDIANA

STURGIS OPERATOR CHAIRS

Easily and quickly adjusted

A model for every need

WRITE FOR PARTICULARS

STROMBERG-CARLSON-TELEPHONE MFG. CO.

ROCHESTER, N. Y.

J. W. WOPAT

Consulting Engineer

Telephone Engineering
Construction Supervision
Appraisals—Financial
Rate Investigations

1510 Lincoln Bank Tower Fort Wayne, Indiana

J. G. WRAY & CO.

Telephone Engineers

Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies

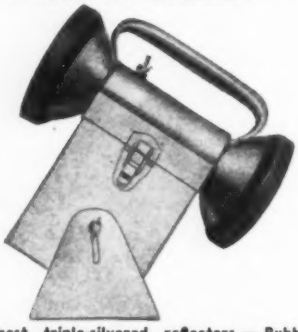
3324 Bankers Bldg., Chicago

XUM

CLASSIFIED SECTION

Rates 10 cents per word payable in advance. Minimum charge $2.00 for 20 words or less.

T & T
NOW STANDARD for BELL SYSTEM
2-HEAD WORKLIGHT
1 flood for nearby work
1 beam for overhead



Finest triple-silvered reflectors — Rubber lens guards—"Shatter-proof" glass—Enameled rust-proofed steel.
Uses 2 telephone type No. 6 cells—Height 11"—Weight 8½ lbs.

IF INTERESTED MAIL FOLLOWING

CARPENTER MFG. CO.
SIDNEY ST., CAMBRIDGE, MASS.

Send.....T & T lights on 30-day approval without obligation to us.

Send literature.....

Your Company.....

Address .....

Your Name and Title.....

SPECIAL TICKETS **28¢**

20-lb White Sulphite Bond; size 2½x5; your special copy; any color ink; banded in 500's, 30,000 to carton; carton price **PER 1,000**

Westwood Press, Newton, Iowa

DIRECTORY PRINTING

Now serving 88 exchanges in 6 states. After several years' successful and compilimented (by customers) experience we would like to add a few more directories of 2-column 6⅛x9¼ or 7¼x10¼ sizes. E. W. STEPHENS CO., Columbia, Mo., hoping to hear from you.

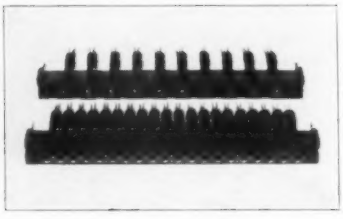
TELEPHONE ACCOUNTING SERVICE

ACCOUNTING SPECIALIST. Twenty-seven years' practical experience in public utility accounting and auditing. Telephone work a specialty. Frank M. Clark, 510 West Washington Avenue, Madisen, Wisconsin. Write or telephone Fairchild 4965M for appointment.

HELP WANTED

WANTED: Experienced switchboard man for wiring and assembling. Write No. 8979, care of TELEPHONY.

RECONDITIONED WESTERN ELECTRIC CO. JACKS



No. 138 JACK ON No. 110 MOUNTING 10 PER STRIP
No. 138 JACK ON No. 108 MOUNTING 20 PER STRIP
No. 138 JACK ON No. 112 MOUNTING 20 PER STRIP
No. 193 JACK ON No. 120 MOUNTING 20 PER STRIP
No. 193 JACK ON No. 122 MOUNTING 20 PER STRIP
No. 193 JACK ON D-19561 MTG. 10 PER STRIP

Write for prices.

BUCKEYE TELEPHONE and SUPPLY COMPANY
COLUMBUS, OHIO

RECONSTRUCTED EQUIPMENT

Western Electric No. 323 transmitters complete with mouthpiece and back....@	$ 1.25
Kellogg No. 41 slip type receivers with new shell and cord.....@	1.25
Western Electric 3 cell metal battery boxes.....@	.55
Connecticut Tel. & Elec. combination central battery and magneto external post connection desk or hand set signal set with 3-bar generator and 1,000 ohm ringer wired to work with any standard 3-condition hand or desk set.....@	6.00
Automatic Elec. No. 426 desk set complete with No. 24 dial and either Molded Plastic or No. 500 enclosed gong signal set with anti-side tone induction coil.....@	12.00
Kellogg latest type No. 2800 4-bar 1000-1600 or 2500 ohm ringer compacts with short arm .....@	9.25
Stromberg-Carlson latest type No. 896 compacts 3-bar 1000-1600 or 2500 ohm ringer @ $7.50; 4-bar @ $8.75; 5-bar.....@	9.50
Western Elec. No. 46 C. B. induction coil @ $.50; No. 20.....@	.35

REBUILT ELECTRIC EQUIPMENT CO.
1934 W. 21st Street
Chicago, Ill.

FOR SALE

FOR SALE: Western Electric magneto switchboard, 160 lines equipped with rack, fully equipped power ringer and transmitter; 200 ft. cable 200 pr. Complete outfit. Priced to sell. Breda Switchboard Company, Breda, Iowa.

FOR SALE: 200 No. 315H Western Electric magneto ringer boxes, @ $3.00; 225 Western Electric magneto wall telephones, @ $3.75; 250 3-cell metal battery boxes, @ $.50; 1 No. 1800 Western Electric sectional magneto PBX with six cord circuits and thirty lines, all equipped; $200.00. Above prices F.O.B. Crossett, Arkansas. Public Utilities Company, Crossett, Arkansas.

WANTED TO BUY

WANTED TO PURCHASE: A used Common Battery board equipped with approximately 45 drops and jacks for magneto, and 300 lines of Common Battery equipment. This board may have universal line circuits or straight Common Battery. The board is needed for delivery about March 1, 1941. In reply furnish all details. Write No. 8980, care of TELEPHONY.

POSITIONS WANTED

COMPETENT telephone man wants position caring for or managing exchange or system of exchanges. Ability and character references furnished. Write No. 8978, care of TELEPHONY.

POSITION WANTED: Ambitious and capable executive type telephone man, graduate engineer, with fifteen years' Bell and Independent experience in supervision of large plant operation. Will consider offer where ability to produce results is required. Write No. 8975, care of TELEPHONY.

XUM

Trouble MAKES YOU GLAD THAT YOU DEAL WITH GraybaR

We're not endorsing sleet storms, hurricanes or floods, mind you, but if and when they *do* come, you'll see what it means to have an outfit pledged to *action-service* backing you up! » » » It's more than just *willingness to help* in an emergency (we're sure everybody wants to help). It's the *ability and capacity* to come through with the supplies you've got to have that makes GRAYBAR your logical source of supply.

Evidence? Well, hark back a few years to the New England Hurricane, the Ohio Valley Floods, or any other blizzard or twister or ice storm that comes to mind. Then ask the folks that bore the brunt of the trouble: "What sort of help did you get from GRAYBAR?" We'll rest our case on the replies.

Reasons why? Well, run your eye down the list at the left. Then consider: "With GRAYBAR ready to serve our ordinary day-to-day needs so well, why should we wait till trouble strikes to give the GRAYBAR Man a call? Right?

5 "REASONS WHY" GraybaR COMES THRU IN EMERGENCIES

1 *We've been through it before.* Perhaps not in your town or territory, but each year, somewhere within GRAYBAR'S nation-wide sphere of service, we get more and more experience on how to *prepare* for emergencies and how to *get into action* when they strike.

2 *Adequate stocks . . . the kind your need.* GRAYBAR local warehouse stocks of line maintenance and repair equipment, tools, wire, cable and all the rest are carefully planned and kept up to par to give the greatest possible protection-factor consistent with good business practice.

3 *Combined resources can be rallied when necessary.* The large number of GRAYBAR warehouses in each section of the country means that, in meeting a major emergency, stocks of supplies can *quickly* be rallied to reinforce local capabilities.

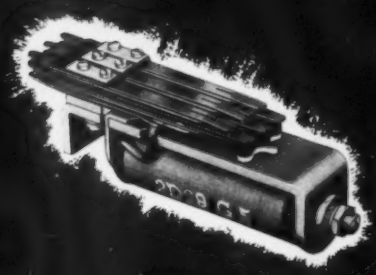
4 *Manpower that knows the business.* GRAYBAR managers and specialists average over 20 years experience. They know what you're going to need, and can handle your rush demands with a minimum of red tape or mix-ups.

5 *"One call brings them all" . . .* GRAYBAR'S admitted leadership in the completeness of its line construction and maintenance items and the scope of its service in this field is doubly welcome when every minute counts. One call brings everything you're waiting for.

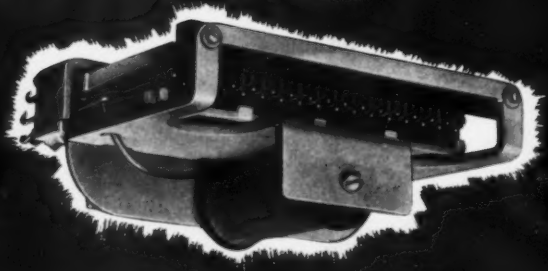
GraybaR IN OVER 80 PRINCIPAL CITIES
Executive Offices: Graybar Building, New York

GraybaR QUALITY SINCE 1869 — *Everything Electrical* — GraybaR ELECTRIC COMPANY

XUM

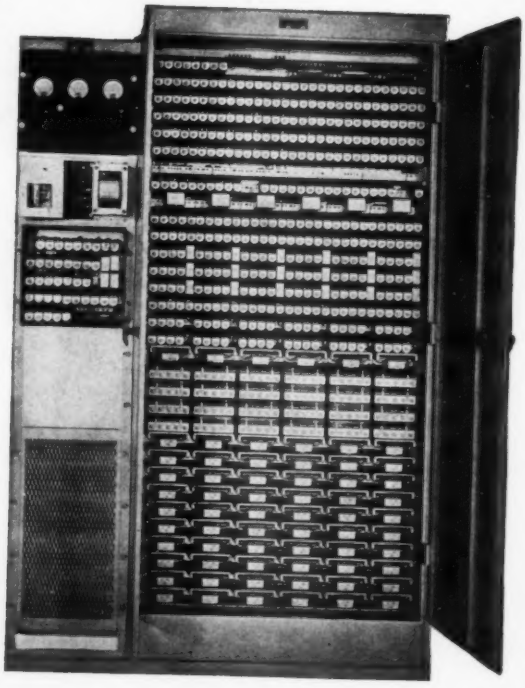


+



=

DIAL
EXCHANGE



NG

EE

ER

CO.

VOL

XUM